

Naval Doctrine Publication 4

Naval Logistics

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FOREWORD

Naval logistics is the *sine qua non* of our combat power and is the bridge that connects our nation's industrial base to forward-deployed naval forces.

Whether appearing in the form of effective peacetime forward presence or decisive power projection, readiness and the ability to sustain such operations are the hallmarks of our Navy-Marine Corps team—and both readiness and sustainability hinge upon logistic support. Certainly, effective logistic support will not always guarantee success; lack of such support, however, inevitably will bring failure.

Naval Doctrine Publication (NDP) 4, Naval Logistics, is the fourth in the series of capstone publications that articulate naval doctrine. Every naval professional must understand its contents. NDP 4 discusses the basis of operational naval logistics and establishes the foundation for development of follow-on tactics, techniques and procedures, which are contained in the series of logistics Navy Warfare and Tactics, Techniques, and Procedures Publications (NWPs and NTTPs) and Marine Corps Doctrinal and Warfighting Publications (MCDPs and MCWPs).


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INTRODUCTION

The U.S. military's ability to project power is a reflection of our ability to equip, train, and deploy our forces. Without adequate military hardware and other logistics support, well-trained Sailors and Marines cannot accomplish their mission. Whether it is providing supplies, services, and infrastructure or conducting thorough planning with effective organizations, logisticians are the professionals who provide this service. Naval Doctrine Publication (NDP) 4, Naval Logistics, is the foundation on how the naval service provides this support.

In an era of decreased force levels and infrastructure, our naval forces remain the most independent and flexible instruments of national policy. With their ability to operate from the sea, the naval services provide both peacetime as well as contingency options to our military leaders. Robust and responsive logistics support is critical to operate from this environment. Naval Logistics explains how support for these operations is planned and accomplished and discusses the systems that move forces to the fight and sustain them there. This capstone publication focuses on the fundamental principles guiding our logistics operations. Other publications in the Navy, Marine Corps, and joint libraries provide added detail and perspective on specific areas of naval logistics including supply, maintenance, transportation, engineering, and health services. References to these publications are listed at the end of this publication.

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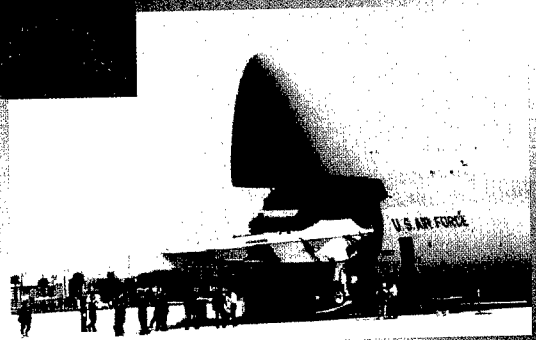
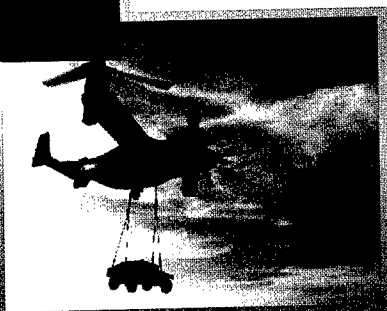
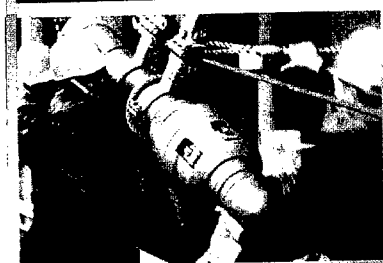
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CHAPTER ONE

The Nature and Fundamentals of Naval Logistics

“Logistics provides the physical means for organized forces to exercise power. In military terms, it is the creation and sustained support of combat forces and weapons. Its objective is maximum sustained combat effectiveness.”

—Rear Admiral Henry Eccles, USN (Ret.)

Introduction

Naval forces are among the most responsive, flexible, powerful, and independent tools of national policy. U.S. Navy forces contribute decisively to global leadership. Through power projection and presence, our naval forces support our national interests abroad. A strong naval team capable of deterrence and contingency operations at sea, from the sea, and in operations other than war is essential to this effort. Key to the strength of this team is logistics support, provided by trained personnel within an intricate network *of materiel, facilities, transportation, technical support, and information*. Naval logistics builds and sustains our forces, in readiness and in action.

Effective naval logistics enables us to carry out the Navy and Marine Corps' assigned roles. It supports our ability to conduct continuous forward presence, peacetime engagement, deterrence operations, and timely crisis response from the challenging maritime and littoral environment. Through our logistics systems, Navy and Marine Corps striking power is always available, and always sustainable through an established support

system. An extensive defense distribution system comprised of military bases at home and abroad, combat logistics force ships, and expeditionary support forces including airlift and sealift, as well as resources from sister Services, host nations, and commercial contractors provide the means for this projection power.

Sustained forward deployment of naval forces also allows our nation to pursue regional coalition-building and collective security efforts. Thus, naval logistics forces must be able to provide and receive support within a variety of organizational structures. Consequently, engagement in joint and multinational logistics efforts are increasingly critical to support mutual readiness and capability, enhancing the efficiency and effectiveness of our combat operations.

Naval logistics operations are conducted much the same in peace as they are in war. They support and sustain the warfighter whenever and wherever, differing mainly in the magnitude of the requirements placed on the logistics systems and the level and types of threat to which these systems are exposed. A viable, accessible, and ready reserve of trained personnel and effective equipment, and reliable sources of war materiel, must back active logistics forces. These resources must also include agreements and understandings that permit the sharing of logistics resources among other services, other nations, and the private sector of all engaged nations.

To participate in and benefit from effective naval logistics, supported and supporting commanders need to understand the mission, scope, and different levels of logistics support. In addition, one needs to understand the functional areas, the process elements, the guiding principles, and the conceptual background driving the current evolution of naval logistics.

Mission of Naval Logistics

The mission of naval logistics is to provide and sustain the operational readiness of our naval forces, and to support the operational readiness of other forces as directed. In peace, operational readiness enables our naval forces to accomplish a wide variety of missions—independently or in conjunction with other services, agencies, allies, or coalition partners. In war, this same operational readiness is the root of warfighting effectiveness; it makes victory possible.

Effective logistics is a force multiplier, allowing the commander to maintain greater masses of power in harm's way for longer periods. This is accomplished through optimizing readiness at best value while providing responsive maintenance and sustainment. Naval logistics has historically provided the full range of logistics support to naval forces. Additionally, naval logistics forces provide sealift for the projection and sustainment of naval and non-naval forces.

Scope of Logistics

Within the Navy and Marine Corps and throughout the Department of Defense, there continues to be pressure to reduce force levels and minimize system costs by rationalizing force constitution, projection, and sustainment around the world. From international and inter-Service acquisition programs to joint, multinational and interagency operations, cooperative activities have broadened both the resource base and the customer base for the naval logistician.

Whether for peacetime operations, war, or military operations other than war, logistics operations are conducted in support of forces, and are subject to the risks and uncertainties common to military missions. More broadly, logistics encompasses all of the processes, procedures, systems, and activities utilized to acquire, provide, maintain, and dispose of end products—equipment, supplies, facilities, services, and trained manpower—for military forces.

More than most components of military operations, logistics can be expressed mathematically. The quantification of requirements and capabilities demanded by the warfighters allow the logisticians to perform precise calculations and useful predictions. Projecting requirements for food or fuel in any operation confidently helps us project the outcome of maneuver or engagement. This predictive capability provides the baseline from which logisticians act in response to changing customers, customer locations, and support requirements.

Creative crisis response is another part of effective logistics; in spite of its scientific basis, logistics is also an art. Increased operating tempo and attrition of logistics capability through natural events, accidents, or enemy action combine to create shortfalls in support. These events reduce the reliability of previous projections, forcing the logistician to constantly monitor

and adjust operations. Prediction, anticipation, innovation, and improvisation must be skillfully exercised as operations unfold. Logisticians must apply judgment and perception to the available information to ensure effective decision-making.

Levels of Logistics Support

Logistics support is provided at the strategic, operational, and tactical levels, and involves interrelated and often overlapping functions and capabilities.

Strategic Logistics encompasses the ability to deploy and sustain forces executing the national military strategy whenever and wherever. It involves determination of requirements, personnel and materiel acquisition, and management of strategic airlift and sealift for the optimum levels of readiness at best value to the Navy. It also includes the role of prepositioned equipment and materiel—both afloat and ashore—and our national ability to maintain the required support levels for the duration of operations. A particular concern at the strategic level is that our industrial bases maintain the capability, capacity, and technology to support timely production of modern weapon systems, support equipment, health services, munitions, stores, and command and control system components to meet wartime requirements. The greater the scope or duration of anticipated military operations, the greater the impact of continuing effective strategic logistics operations.

Operational Logistics involves coordinating and providing theater logistics resources to operating forces. It includes support activities to sustain campaigns and major operations within a theater and is the level at which joint logistics responsibilities and arrangements are coordinated. Operational logistics encompasses theater support sites and activities, ashore or afloat, and the theater transportation required to move personnel and materiel to and from supported forces. It also entails management and protection of those assets. It is the bridge that translates strategic logistics capability into tactical logistics support. The unified combatant commanders and the supporting service component commanders are the main benefactors of this level of logistics.

Tactical Logistics focuses on support within and among combat forces. Navy tactical logistics encompasses the logistics support of forces within a

battle group or amphibious readiness group and within Navy elements ashore, from both afloat platforms—including Combat Logistics Force (CLF) ships—and shore-based logistics support facilities. Tactical logistics support activities include maintenance, battle-damage repair, engineering, fueling, arming, moving, sustaining, material transshipment, personnel, and health service. Marine Corps tactical logistics, including combat service support (CSS), is provided by task-organized combat service support elements that complement the organic capabilities of the combat elements.

The Functional Areas of Logistics

Logistics activities at each level of support require a broad range of skills, knowledge, and capabilities. These form six major functional areas allowing us to understand, organize, and execute logistics. They are supply, maintenance, transportation, engineering, health services, and other logistics services. Applied in appropriate combination, they provide forces with total logistics support. These functional areas are consistent throughout the Armed Services, and provide a common fabric of logistics organization that facilitates joint operations. Below is a brief synopsis of these respective functional areas of logistics.

- ◆ **Supply** provides materiel and services for our forces. The supply function includes design, procurement, contracting, receipt, safe storage, inventory control, issuance, retrograde, and disposal of end items including repairables and consumables. The defense supply system, which includes the Navy and Marine Corps supply systems, equips and sustains our military forces during all phases of preparation and employment. The defense supply system manages millions of items, which are grouped into 10 classes of supply for management purposes. The classes of supply are listed in Figure 1-1. Additional supply support is derived from sources such as other defense and federal agencies, Navy hardware systems commands, local contracts and purchases, common-user support from other Services or allied supply agencies, and host nation support.
- ◆ **Maintenance** entails all actions necessary to preserve, repair, and ensure continued operation and effectiveness of systems (e.g., ships and aircraft), components, and equipment. It includes the policy, organization, and activities related to the maintenance of equipment, afloat and ashore. The Marine Corps identifies eight functions of maintenance:

CLASS		PRIMARY INTEGRATED MATERIAL MANAGER
CLASS I	➔	DLA
• Subsistence		
CLASS II	➔	DLA/GSA
• Clothing		
• Individual Equipment		
CLASS III	➔	DLA
• POL		
CLASS IV	➔	DLA
• Construction Material		
CLASS V	➔	SPECIAL MGMT
• Ammunition		See NWP 4-10
CLASS VI	➔	OUTSIDE MGMT
• Personal Demand Items		See NWP 4-09
CLASS VII	➔	MAJOR SYSCOMS
• Major End Items Incl Weapon Systems		
CLASS VIII	➔	DLA
• Medical Material		
CLASS IX	➔	DLA
• Repair Parts		
CLASS X	➔	NONE
• Non Military Items		

Figure 1-1. Supply Classifications

inspection and classification; servicing, adjusting, and tuning; repair; modification; rebuilding and overhaul; reclamation; recovery and evacuation. Maintenance strategies, standards of performance for preventative and corrective maintenance, technical engineering support, and battle-damage repair are important components of the maintenance function. Conservation, reutilization, and disposal are also important to the economical and environmentally sound support of forces. While maintenance is primarily involved in the sustainment process, the collection, analysis, and reporting of materiel maintenance data is critical to effective acquisition. Maintenance is conducted at three levels—organizational, intermediate, and depot.

- ◇ **Organizational maintenance** consists of unit-level inspections, cleaning, servicing, lubricating, adjusting, and minor repairs. It is the responsibility of the unit to which the equipment is assigned, and is generally performed by ship's company, naval air squadron, or Marine Corps and shore-based Navy unit personnel without outside assistance.
- ◇ **Intermediate maintenance** is normally beyond the capabilities of the using unit, but is not so extensive as to require major industrial facilities or equipment. It involves calibration, repair or replacement of damaged or unserviceable parts, components, or assemblies; emergency manufacture of unavailable parts; and technical assistance to unit maintenance personnel. It is the responsibility of maintenance activities designated to provide direct support to the units assigned the equipment. In naval logistics, tenders and larger combatant ships provide intermediate-level maintenance. Within the battle force, intermediate maintenance is provided through the Battle Force Intermediate Maintenance Activity (BFIMA). The BFIMA consists of the carrier's or amphibious assault ship's aircraft intermediate maintenance department (AIMD), the engineering departments of all the ships, and the electronics maintenance officers and skilled technicians in or embarked in the ships. Intermediate maintenance is also available through fleet or contractor facilities ashore such as ship intermediate maintenance activities (SIMAs), specialized elements of the Marine Air-Ground Task Force (MAGTF), and designated joint or combined intermediate maintenance facilities. Intermediate maintenance provides a forward source of repair support that allows the supported force to maintain or recover mission capability within the theater of operations.
- ◇ **Depot maintenance** involves major overhaul or a complete rebuild of parts, assemblies, subassemblies, and end-items, and may support organizational or intermediate maintenance by providing technical assistance. This maintenance is provided by shipyards, ship-repair facilities, aviation depots, in-service engineering centers, naval warfare centers, weapons stations, Marine Corps multi-commodity maintenance centers, and civilian contractors.
- ◆ **Transportation** provides for the movement of units, personnel, equipment, and supplies from the point of origin to the final destination. This function includes deployment and redeployment of supported and

supporting forces, the transportation of sustainment resources, movement of forces and resources to ports of embarkation, and inter-theater and intra-theater operations. The transportation system operates at every level of logistics and provides for the movement of casualties, mail, and other critical services as well. The Marine Corps also identifies embarkation, landing support, motor transport, port and terminal operations, air delivery, material handling equipment operations, and freight or passenger transportation as functions of transportation. Further delineation of the levels of transportation include:

◇ **Strategic Transportation**, which encompasses the movement of resources to and from the theater of operations. Navy ships and their embarked forces including naval air squadrons and detachments and Marine Corps expeditionary units are initially self-deploying. Sustainment for these forces is provided either by onboard organic resources or via Combat Logistics Force (CLF) ships. In other cases, naval operating and support forces must be transported to and from theater. These situations can include Marine forces; Navy shore-based logistics forces; security, small boat, and special operating force units, and other elements of shore-based squadrons. Methods to deploy these units are via strategic common-user land, sea, and air transportation provided through the U.S. Transportation Command (USTRANSCOM), utilizing the assets of the Military Sealift Command (MSC), the Air Mobility Command (AMC), and the Military Traffic Management Command (MTMC). These commands use both military and civilian assets as available and appropriate. The Navy's MSC provides the DOD strategic heavy lift and also supports the Marine Corps Maritime Preposition Force (MPF) Program and assault follow-on echelon as well as the U.S. Army's afloat prepositioning needs.

◇ **Operational Transportation**. This transportation is the bridge between the strategic lift provider and the operating forces. CLF ships, and Navy vertical onboard delivery (VOD) helicopters and carrier onboard delivery (COD) aircraft, provide transportation to and from afloat forces. These resources may be augmented or replaced by other national military or commercial assets during combined operations. For shore-based forces, tactical transport aircraft and heavy lift can also provide transportation support helicopters.

◇ **Tactical Transportation.** Within the battle force, most tactical transportation is via ship's organic aircraft. Assigned helicopters shuttle personnel, sustainment, mail, and other materiel from sites and support ships, and within the battle force. Tactical transportation also allows battle group commanders to share resources and capabilities to enhance the overall readiness of the force. Ashore, sites and forces utilize organic vehicles or aircraft for tactical movements. Within the Marine Air Ground Task Force (MAGTF) the aviation combat element (ACE) provides assault support aircraft; the ground combat element provides amphibious assault vehicles (AAVs) and tactical ground transportation; and the combat service support element (CSSE) provides landing support, material handling equipment, and tactical ground support transportation.

◆ **Engineering** provides construction, damage repairs, combat engineering, and facilities maintenance ashore, executed by Navy, Marine Corps, and other Service engineer units; and civilian contractors. The Naval Construction Force (NCF) units, known as "Seabees," support Marine Corps engineer capabilities providing extensive technical and manpower resources in constructing advance bases, upgrading supply routes, developing aviation support facilities, and providing battle damage repair. Additionally, via the Navy Component Commander, these units provide ship to shore support, pier construction and repair, well-drilling, Fleet Hospital erection, construction of water and fuel storage and distribution and electrical power generation systems, and utilities maintenance for naval and other forces ashore. Navy civil engineers, both military and civilian, through the Naval Facilities Engineering Command (NAVFAC), also provide planning, engineering, facility contracting, real estate acquisition, and environmental support to the Navy or joint force commander (JFC). In both cases, the Navy engineer units benefit from the use of advanced base functional components (ABFC) in meeting the commander's needs. On the Marine Corps side, Marine Corps engineers are found in the Combat Engineer Battalion (CEB) of the Division, the Marine Wing Support Squadrons (MWSS) of the Marine Aircraft Wing (MAW), and the Engineer Support Battalion (ESB) of the Force Service Support Group. Marine Corps division engineers conduct combat engineering operations supporting mobility, countermobility, and survivability in forward areas. The MWSS provides the MAW basic engineering services organic to expeditionary airfield support. Finally, the ESB provides general engineering support to all elements of the MEF. This includes engineer reconnaissance, horizontal and vertical construction,

facilities maintenance, demolition and obstacle removal, and explosive ordnance disposal. Increasingly, engineer requirements are supported through joint, combined, contracted, or host nation engineering organizations.

◆ **Health Services** support the health of naval personnel and their families. This support includes medical and dental materiel, facilities, and services in both combat and non-combat situations. In contingency operations, these services are provided through organic assets including hospital corpsmen, shipboard sick bays, medical and dental battalions of the Marine Corps' FSSG, Fleet Hospitals, hospital ships (T-AH), and other fixed outpatient and inpatient facilities including other-Service, contract, or host nation facilities. The functions of HSS are health maintenance, casualty collection, casualty treatment, temporary casualty holding and evacuation, emergency and routine health care, monitoring the health, sanitation, and medical readiness of deploying forces; medical service record maintenance, and maintaining mass casualty plans. Additionally, it includes training personnel in first aid; maintaining medical intelligence files; implementing preventive medicine measures; disposing of medical waste; and ensuring combat readiness of deployed and deployable health care personnel. HSS also maintains cognizance over the supply of medical and dental materiel and blood and blood products.

◆ **Other Logistics Services** are required to provide administrative and personnel support to achieve maximum operational capability of a force. This support extends to those areas of personnel support, quality of life, and morale issues that help define the combat effectiveness of the individual. Other logistics services include billeting; disbursing; exchange services; food services; legal services; morale, welfare, and recreation (MWR); mortuary affairs; and postal services. While all are provided for naval personnel, the Marine Corps recognizes separate organic, command support services inherent in any organization (like billeting and personnel administration) and those services that come under CSS, provided by organizations resident in the CSSE. Marine Corps services provided under CSS include disbursing, postal, legal, security support, exchange, civil affairs, mortuary affairs, and food services.

◇ **Billeting** provides short or long-term housing for military and civilian personnel. Inherent in shipboard assignment, billeting support is a critical issue for shore-based and transient personnel. While Marine

Corps and certain shore-based Navy forces are self-sufficient in field billeting, expeditionary deployment of shore-based squadrons and support forces can create serious billeting deficiencies. Often, these must be met through contracting or host nation support if adequate infrastructure exists abroad. Satisfactory billeting resources are crucial for the high morale of our combat forces.

- ◇ **Disbursing** pays naval force obligations, including personnel and logistics support. Local contracting and small purchases can be critical to effective logistics support during deployments; timely and correct discharge of the resulting debts ensures continued access to support. Also, expeditionary force members may be required to subsist or draw specific services off the local economy, and adequate disbursing support under such circumstances is vital. In the absence of existing or deployed disbursing capability, emergency support may be requested from other forces in theater.
- ◇ **Exchange and Barber, Laundry and Ship's Store (BLSS) Services** provide basic goods and services to military personnel via Navy and Marine Corps Exchange activities or BLSS units while on station or deployed. Where exchange services are not available through naval support or Army Air Force Exchange Services (AAFES), local vendors may be used to supplement necessary support. Afloat ships' stores provide personal necessities as well as laundry, dry cleaning, vending, and barber facilities. For naval forces afloat and ashore, access to these services is important to morale and personnel health.
- ◇ **Food Services** furnish meals to naval personnel. Food services refer to the local storage, breakout, preparation, and serving of food, with its associated sanitation and accounting requirements. Food service is tactical support; replenishment in support of food service operation is a supply function at the strategic, operational, and tactical levels. Local purchases or local contracts for food service operations may blur this distinction. Food service capabilities are organic to ships, bases, and some expeditionary Navy shore-based units. Other shore-based Navy forces are not self-supporting, and must be subsisted off other forces or the local economy. When initial food service facilities are unavailable, naval forces rely on Meals-Ready-to-Eat (MRE) and other similar rations until such facilities can be established.

- ◇ **Legal Services** provide legal assistance in direct support of individuals, or in support of operating force planning, contracting, and operations. Increasing participation in multinational operations means a more complicated legal environment for both individuals and organizations. Prompt and effective legal advice or action can enhance the efficiency of the operating forces. Via the Naval Legal Service Command, service members are afforded basic legal support regarding personal issues. In addition, this office augments support normally provided by staff judge advocates.
- ◇ **Morale, Welfare, and Recreation (MWR)** offers sports, community, youth, and other recreational programs, as well as opportunities for travel, relaxation, education, and cultural enrichment for the service member. The application of naval force in presence and force projection roles leads to long and sometimes arduous deployments for Sailors and Marines. Important to morale and retention of a quality force, MWR activities are critical to the deployed force commander. Quality efforts to provide relief from separation, monotony, and anxiety are effective force multipliers, contributing to both the mental and physical readiness of the deployed military unit.
- ◇ **Mortuary Affairs** provide final care services for the service member's family. It includes search, recovery, identification, and disposition for the remains and personal effects of deceased members. Mortuary affairs are a Service responsibility, and the unit is responsible for initial recovery and identification. In the United States, and during peacetime overseas, the Navy and Marine Corps conduct all mortuary affairs for their members. As it entails a recovery, staging, transportation, and tracking and custody process, mortuary affairs is identified as a supply activity. During contingency operations, the Army is the responsible agent for mortuary affairs overseas, and maintains special mortuary and graves registration units for this purpose. Initial recovery and identification, and delivery to a central Army collection point, remain Service responsibilities.
- ◇ **Postal Services** provide a range of critical support services. The most recognized value of postal services has been to maintain the tenuous thread of personal contact between the deployed member and his family and friends. This is particularly true in forward areas and at sea, where electronic means may be in short supply or may be curtailed for security purposes. Mail is also the most effective way to

transmit personal parcels, providing physical demonstrations of the ties between the member and the home front. Mail also serves major support functions for the operating force. Fleet CINCs assign area mail routing coordinators and establish Fleet Mail Centers (FMC) to control the consolidation and dispatch of mail in theater. Expeditionary Mobile Mail Centers (MMCs) may be drawn from the Naval Reserve to operate in theater, and postal personnel are often attached to other expeditionary logistics units transferring mail at Advanced Logistics Support Sites (ALSSs) and Forward Logistics Sites (FLSs). Individual units ensure effective mail distribution by providing current mail routing instruction (MRI) messages.

These six logistics functional areas combine and integrate to provide total logistics support. Planning and execution of responsive, sustainable support requires balancing the functional areas to provide the right support at the right time and place. The appropriate balance and level of support flow through various activities, channels, modes, and nodes to the end user. Regardless of the type of support or the specific means of delivery, logistics support across the full range of functional areas is provided through a series of elements.

Process Elements

The activities of the logistics process may be reduced to four general elements—acquisition, distribution, sustainment, and disposition. Every logistics action may be expressed in terms of its contribution to one or more of these elements. These four elements, summarized in Figure 1-2, make up our overall logistics process.

Acquisition. The capability of naval forces rests on the investment in operational readiness. The principal acquisition organizations are the Navy and Marine Corps systems commands including Naval Sea Systems Command (NAVSEA), Naval Air Systems Command (NAVAIR), Space and Naval Warfare Systems Command (SPAWAR), Marine Corps Systems Command (MARCORSYSCOM), Naval Supply Systems Command (NAVSUP), Marine Corps Materiel Command, the Marine Corps Logistics Bases Command, Naval Medical Logistics Command (NAVMED-LOGCOM), the Naval Facilities Engineering Command (NAVFAC), the Defense Logistics Agency (DLA), and the General Services Administration (GSA). These organizations are responsible for procuring, producing,

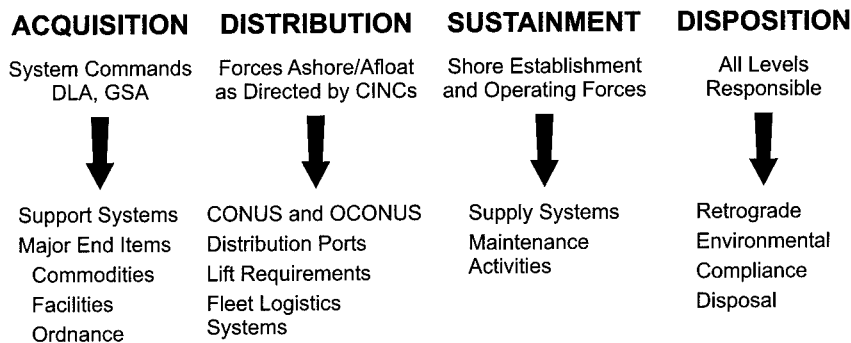


Figure 1-2. Logistics Process Elements

or constructing commodities, facilities, ordnance, and major weapon systems and end items. The Systems Commands are also responsible for life cycle management through a comprehensive systems support program known as Integrated Logistics Support (ILS). This program includes technical data, supply support, facilities, personnel, packaging, storage, handling and transportability, training and training support, maintenance planning, and design interface. This system also addresses environmental, safety, and health planning during acquisition.

Forward operations, geographically removed from much of the formal acquisition process, often demand time-sensitive reactions to support requirements. Local contracting can often support these requirements and reduce demand on the CONUS industrial base and may significantly reduce transportation requirements, while simultaneously reducing response time. NAVSUP coordinates the Navy Contingency Contracting Program through the Navy Regional Contracting Centers (NRCCs). The NRCCs provide a global network of field offices and deployable contracting capability. NRCC contracting support may be augmented or supplemented by deploying additional reserve or other contracting support to theater. Additionally, DLA Contingency Support, Contract Administration Teams, and Fuels Management Teams can deploy to support CINC contracting needs. Within the engineering realm, NAVFAC administers the Construction Capabilities (CONCAP) contract, and also provides for the Navy timely real estate acquisition authority.

Distribution. Distribution refers to the processes used to get materiel, services, and personnel to the supported forces. It includes overall management, inventory control, and integration of information. Initiatives such as Direct Vendor Delivery have broadened the definition by moving

distribution of selected items to the civilian sector. Increasingly, the logistics planner may incorporate non-military options into his mix of scarce distribution resources. Transportation decisions also depend upon what is being moved, its origin and destination, the lift assets available, and the urgency assigned. The transportation mode is based largely on the weight, size, urgency, and special handling requirements of the shipment. Airlift is normally reserved for passengers and high priority mail and cargo. Because a large proportion of naval operating forces are self-deploying, embarked on Navy ships, forward-deployed, or prepositioned, distribution considerations during initial deployment are largely the concern of shore-based forces. Responsive distribution of sustainment is a monumental concern for all naval forces. High speed operational maneuver across broad areas of ocean, flexible reassignment of afloat units between task forces or groups, and operational movement of units in and out of theater (as in escort forces and shuttle ships) demand flexible distribution. Rapid embarkation and debarkation of Marine Corps forces, aircraft, staffs, and other units also challenge the distribution system by shifting customer locations. The naval logistician must be adept at hitting constantly moving targets with critical sustainment, carefully monitoring ship and unit movements to anticipate the strategic and operational channels and modes most likely to put the support at the right place and time.

Sustainment. Sustainment is the provision of personnel, logistics, and other support required to maintain operations. This provision normally takes place at the operational level, where services and supplies processed through the distribution system actually reach the supported force. The term sustainment is also applied to specific materiel; in this usage, "sustainment" means those items planned or processed through the logistics system to fuel the sustainment element. Planners use this distinction to separate resupply from forces in deployment planning. When national leaders call on naval forces, they expect both responsiveness and staying power. Forward deployed naval forces carry with them initial sustainment stocks. Proper sustainment allows forces to remain on station as long as needed. Establishing and maintaining this reliable flow of materiel and services to operating forces is accomplished through the operation and management of logistics support activities. Sustainability depends on the effective participation of all providers across the functional areas of logistics.

Disposition. Disposition is the handling, stowage, retrograde, and disposal of materiel and resources released or returned by forces. Logistics economy, attainability, and sustainability are all dependent on the careful

husbanding of limited resources. Similarly, efficient processing and shipment of excess materiel replenishes stocks available to other theaters, and can reduce the theater “footprint” needed by removing unessential stocks.

Disposition includes cleanup of environmental and other damage incident to operations. Minimizing environmental damage requires responsible and conscientious action at all levels. Naval commanders must also act to protect the environment during all phases of an operation. Noise, air and water pollution, waste disposal, hazardous materiel storage, and accidental discharge are examples where environmental damages potentially can occur. All military forces are required to protect the environment to the extent operationally feasible through applicable DOD, local, national, and international environmental laws and regulations. The Navy, through the Supervisor of Salvage, has an oil spill-response capability including systems, equipment, materiel, and personnel. Working together with the Coast Guard, who has primary responsibility for oil-pollution response for U.S. waters including the Economic Exclusion Zone (EEZ), the Navy is committed to support cleanup actions in response to major oil and hazardous substance spills, accidental releases, and environmental terrorism.

Principles of Logistics

Naval logistics—provided at the strategic, operational, and tactical levels; organized within the six major functional areas; and accomplished through application of the logistics process—is guided by a set of overarching principles. Each plan, action, organization, report, procedure, and piece of equipment may be defined and measured in terms of these principles. Each logistics decision is guided by the application of these principles. They are applicable to all military logistics, and provide the common foundation of joint and naval logistics doctrine. Both the operational commander, who needs to know the effective limits of the available logistics support, and the logistics planner, who has to ensure that all the essential elements of the logistics system are incorporated, must understand these principles. These principles of logistics include responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability. See Figure 1-3.

Responsiveness. *Providing the right support at the right time and at the right place.* This is the most important principle of logistics, because it addresses the effectiveness of the logistics effort, and in war an ineffective

effort leads to defeat. Ensuring that adequate logistics resources are responsive to operational needs should be the focus of logistics planning. Such planning requires clear guidance from the commander to his planners. It also requires clear communication between operational commanders and those who are responsible for providing logistics support. The operational commander's concept of operations must be thoroughly familiar to the supporting elements to ensure responsive, integrated support. Responsiveness is a product of logistics discipline, and commanders and logisticians who consistently overestimate their requirements—in quantity or priority—risk slowing the system's ability to respond.

Simplicity. *Avoiding unnecessary complexity in preparing, planning, and conducting logistics operations.* Providing logistics support is not simple, but plans that rely on basic systems and standardized procedures usually have the best chance for success. The operational commander can simplify the logistics task by maintaining cognizance of the available logistics capabilities, communicating clear priorities, and establishing support requirements based on current and accurate data.

Flexibility. *Adapting logistics support to changing conditions.* The dynamics of military operations are such that change is both inevitable and rapid. Logistics must be flexible enough to support changing missions; evolving concepts of operations; and shifting tactical, operational, and strategic conditions. A thorough understanding of the commander's intent enables logistics planners to support the fluid requirements of naval operations. In striving for flexibility, the logistics commander considers such factors as alternative planning, anticipation, reserve capabilities, and redundancy. The task organization of shore-based support tailored from advanced base functional components is an example of flexible logistics response to anticipated operational requirements.

Economy. *Effective employment of logistics support assets.* Logistics assets are allocated on the basis of availability and the commander's objectives. Effective employment requires the operational commander to decide which resources must be committed and which should be kept in reserve. Additionally, the commander may need to allocate limited resources to support conflicting requirements. The prioritization of requirements in the face of limited forces, materiel, and lift capability is a key factor in determining the logistics feasibility of a plan. Common-user materiel, facilities and services may be sourced through joint, combined, or commercial providers at significant savings in transportation, stocks, and facilities. While



Figure 1-3. The Principles of Logistics

certain redundancies may be necessary to responsiveness and survivability, the reduction in logistics “footprint” compounds savings by negating the requirement to support and protect larger logistics operations.

Attainability. *The ability to acquire the minimum essential logistics support to begin operations.* The difference between this minimum essential level of support and the commander’s desired level of support determines the level of risk inherent in the operation from a logistics viewpoint. The accurate determination of the minimum requirements, and the time it will take to reach that level given the available resources, allows the commander to determine the earliest possible date for the commencement of operations. The principle of attainability allows the commander to pursue a higher level of logistics confidence, but an operation undertaken without meeting the minimum needs determined under this principle is, by definition, destined to fail.

Sustainability. *Ensuring adequate logistics support for the duration of the operation.* Sustaining forces in an operation of undetermined duration and uncertain intensity is a tremendous challenge. Forces may operate with a diminished level of support for some time, but every means must be taken to maintain minimum essential support at all times. Sustainability derives from effective planning; accurate projections of requirements; careful application of the principles of economy, responsiveness, and flexibility to provide required support; and successful protection and maintenance of the

lines of communication. Additionally, sustainability is dependent on discipline within the operating forces when establishing requirements and expending limited resources.

Survivability. *Ensuring the functional effectiveness of the logistics infrastructure in spite of degradation and damage.* Logistics forces, sites, transportation modes, lines of communication, and industrial centers are all high-value targets that must be protected. Logistics ships, aircraft, vehicles, and bases may be vulnerable to direct attack by enemy forces or terrorists. Similarly, these assets and the systems that utilize them are subject to disruption by natural disaster, weather, communications failures, civil unrest, contract and labor disputes, legal challenges, and the political decisions of other nations. Survivability requires a robust and diverse logistics system capable of sustaining forces in the face of any obstacle. Dispersion of installations and materiel, maintenance of alternate modes of transportation and lines of communication, redundant logistics communication systems, adequate stock levels, reserves of equipment and personnel, phased delivery, effective use of deception operations, and alternate sources of supply can all support survivability. Force reconstitution and replacement, decontamination, reconstruction, re-equipment, repair, or relocation may restore the effectiveness of logistics systems degraded by battle damage or other events. Accordingly, the survivable logistics must include sufficient assets to support its own recovery as well as the operating forces.

The principles of logistics are always in evidence in a successful operation, but seldom have equal influence. At times the principles make conflicting demands. For instance, total responsiveness and survivability cannot be achieved with maximum economy. The operational commander, supported by his logistics planners, must weigh the relative importance of each principle to the specific operation. By carefully considering each principle in light of prevailing circumstances, the commander is guided toward an effective support plan that will be in consonance with operational requirements and the available logistics resources.

The Future of Naval Logistics

Any logistics system must maintain a current focus; today's support must be effective; today's operations must be efficient. U.S. naval logistics operations have provided a model of excellence to forces around the world.

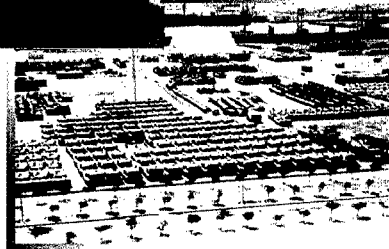
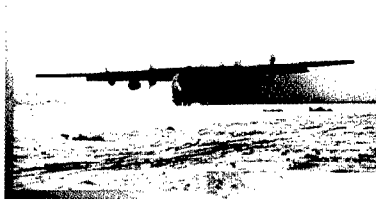
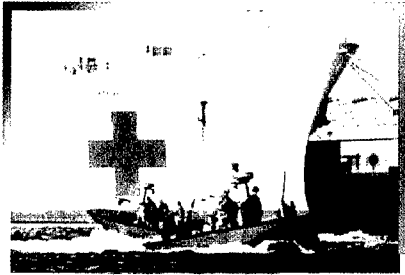
Maintaining and improving that logistics excellence in changing political and operating environments requires an additional focus—forward.

Logistics in the early part of the twenty-first century will be characterized by familiar themes. The systems supported will become more complex. The pace of war will accelerate as more capable forces, supported by better information, maneuver to dominate the battlespace. Battlespace expansion will continue as sensor, communications, command and control, propulsion, weapons, and support systems evolve to permit more dispersed forces to be brought to bear. Economic and political interdependence will bring the interests—and forces—of nations increasingly closer. Combined and joint responses to crises and contingencies of many types will bring wider arrays of forces, agencies, and organizations into the logistics customer base. Logistics systems will meet these challenges through increasingly efficient application of increasingly scarce resources. Logisticians must also leverage technologies to help elevate the effectiveness and the maneuver potential of the operational commander.

Conclusion

In order for naval logistics to effectively carry out its mission of providing and sustaining operational readiness, the warfighter needs to share a common understanding of the basic nature and principles governing logistics operations. The levels, functional areas, and process elements identify the macro components that make up the total naval logistics system. The principles that govern naval logistics provide the authoritative framework that governs the formation and employment of logistics forces. Support of the operational mission and the commander's intent is inherent in the principles of responsiveness, flexibility, attainability, sustainability, and survivability. Recognition of the need for efficiency in the application of limited resources is inherent in the principles of simplicity and economy. Properly balanced, these competing interests channel the logistics effort toward success and optimum readiness at the best overall value to the Navy.





CHAPTER TWO

Naval Logistics Planning

"To be a successful commander at any echelon, you had better think about logistics and you had better make sure that when you are ready to go you have enough fuel, beans, bullets, and bandages—all of the things to sustain your forces."

—General Carl E. Mundy, Jr., USMC
Commandant of the Marine Corps, 1993

Introduction

The dynamic process of providing logistics support to our operational forces is one characterized by the need to respond to continuous change: e.g., changes in support required because actual usage exceeds expected consumption; changes in user location to keep ahead of enemy moves; changes in quantities needed to replace losses in transit or at the theater depot. A responsive logistics planning system and integral information support allows naval logisticians to keep up with these necessary changes to maintain our operational warfighting readiness through uninterrupted logistic support whenever, wherever.

Naval logistics planning and information support is designed to answer these questions: What materials, facilities, and services are needed? Who is responsible for providing them? How, when, and where will they be provided? To find answers, we start with sources of logistics planning guidance, then apply a formal process that parallels operational planning procedures. The nature of the situation will determine whether we apply a deliberate or a crisis action planning process. Using one of these processes, a general plan is formulated that covers the organization, procedures, and

policies of logistics support groups and the specific directives or instructions detailing the execution of support for a particular operation. These rules and tools are imperative for optimizing logistics systems responsiveness to the warfighter. Naval logistics information support systems keep the plan current, accurate, and adequate by providing data on the status of logistic resources, operational force needs, and the ability to meet those needs. Logistics planning and information support are thus complementary. Information enables a commander to apply his experience and judgment to deviate from existing plans. Similarly, formal planning can organize and prioritize a commander's information needs, allowing him to select the best courses of action and adapt what he knows to the situation.

Logistics Planning Considerations

Logistics is the responsibility of the operational commander, who must ensure that his operations and logistics experts integrate their operation and logistic plans. Overall feasibility of these plans will be determined by their ability to generate and move forces and materiel into the theater, then forward to our operating forces.

The complexity of planning would be extremely daunting, but for the fact that both logistics and operations planning are organized processes. Logistics planning needs to shape, anticipate, innovate, and be conducted concurrently with operations planning. Logistics planning is performed in parallel with naval operations planning. Logistic planners identify and resolve support problems early by working concurrently with, and in support of operations planners. All planners must consider the overall support requirements and capabilities. This is accomplished by working back from established objectives, and addressing such issues as adequacy and availability of resources. The result of this process is a logistics concept of operations that parallels the commander's concept of operations, permitting subsequent detailed, tactical-level, support planning. Detailed logistics planning should:

- ◆ Achieve optimum warfighter readiness.
- ◆ Optimize logistics systems responsiveness to the warfighter.
- ◆ Earmark significant time-phased support requirements necessary to maintain and sustain the warfighter whenever, wherever.

- ◆ Identify personnel and cargo throughput at shore-based logistics sites.
- ◆ Identify transportation requirements to support the movement of personnel, equipment, and supplies.
- ◆ Outline the capabilities and limitations of ports, including the Logistics-Over-The-Shore (LOTS) capability to respond to normal and expanded requirements.
- ◆ Recognize support methods and procedures required to meet the needs of the sea, air, and land lines of communications.
- ◆ Coordinate and control movement into the contingency area.
- ◆ Develop reasonable logistical assumptions.
- ◆ Define the extent of needed host nation resources.
- ◆ Designate alternative support sources for host nation support failure.
- ◆ Identify the engineering and construction requirements for sustainability.
- ◆ Identify the source of funding for logistics support.
- ◆ Delineate contracting responsibilities and authority.
- ◆ Consider the meteorologic and oceanographic limitations.
- ◆ Identify health service support requirements.
- ◆ Identify the service and maintenance support requirements for sustainability.

Sources of Logistics Planning Guidance

The National Security Strategy, National Military Strategy, Unified Command Plan, and Joint Strategic Capabilities Plan (JSCP) all form the basis of the theater campaign plan, and, in turn, the logistics support plans. These broad documents—in particular, the JSCP, which conveys the Chairman's guidance—contain the basic planning assumptions for developing

regional plans. Navy and Marine Corps Capabilities and Mobilization Plans, and the Marine Corps Mobilization Management Plan contain detailed policies and force capabilities and allocation for each logistics functional area.

The Logistics Planning Process

The planning guidance provided by joint, naval, and multinational doctrine forms a sound, consistent, and authoritative foundation for naval planning. Naval logistics planners should be ready to participate in joint and combined operations as partners in the planning process, and as spokespersons for Navy and Marine Corps interests and requirements. The planner who understands joint planning can quickly integrate into Service or multinational planning.

Joint Logistics Planning is part of the joint operation planning process. Operational planning, conducted simultaneously at the strategic, operational, and tactical levels, provides the framework for employment of military forces to achieve specified objectives during contingencies. Planners provide for five major activities of joint operations. These are mobilization, deployment, employment, sustainment, and redeployment. These activities are components of force projection, which will be discussed in Chapter Four. In addition, planning may be deliberate, addressing potential future requirements; or crisis action, which addresses emergent planning requirements.

Operational plans must be adequate, feasible, acceptable, and compliant with joint doctrine. An adequate plan is one that will accomplish the mission, while a feasible plan relies on resources that are actually available when required. An acceptable plan is militarily and politically supportable, and is deemed worth the anticipated cost. Developing such plans in accordance with joint doctrine is the goal of the Joint Operation Planning and Execution System (JOPES) deliberate and crisis action planning processes. These are continuing cyclical planning processes that begin when a requirement is identified and continue until it no longer exists.

The Deliberate Planning Process

Deliberate planning prepares for a possible contingency based on the best available information, using forces and resources apportioned by the

CJCS in JSCP. Most deliberate planning is done in peacetime, based on assumptions regarding the political and military circumstances that may prevail when the plan is implemented. Deliberate planning is highly structured and occurs in regular cycles. It produces an operations plan (OPLAN), concept plan (CONPLAN), or functional plan.

Logistics planners prepare the staff logistics estimate during the concept development phase of deliberate planning. This provides the commander with the information to support courses of action (COA) selection, and is developed concurrently with the commander's estimate. Logistics also plays a major role in plan development as supported and supporting CINCs determine support requirements and resolve shortfalls. Finally, logistics planners at many levels prepare supporting plans to provide the mobilization, deployment, sustainment, reconstitution, and redeployment of forces and resources in the OPLAN.

Crisis Action Planning

Crisis Action Planning (CAP) is conducted in rapid response to actual circumstances. CAP follows the general pattern of deliberate planning, but adds flexibility for timely action. If an existing OPLAN is adaptable to the situation, CAP procedures are used to adapt an existing OPLAN to actual conditions or to develop and execute an operation order (OPORD).

Naval Logistics Planning

Naval planning occurs within the framework of the joint planning process. When naval forces are assigned, attached, or apportioned to unified or specified commanders, planning is done in support of the commander's intent. Naval planners provide input to the concept development (including the logistics estimate), plan development, and plan review phases. When a combined, joint, or naval task force is established, the component commander is directly responsible to the task force commander for development of supporting plans, including the logistics annex. The task force commander may often be Navy or Marine Corps, and may have other Service components providing supporting plans. Common planning processes allow products from each level or component to effectively support the overall plan.

For an OPLAN or OPORD, planners for Naval Component Commanders will receive the concept of operations, force apportionment, time-lines, and other pertinent information, and then promulgate the appropriate guidance, and task subordinate and supporting commanders to provide the additional information necessary to build the logistics plan. They will also work within the Joint Planning and Execution Community (JPEC) to resolve strategic and theater-wide planning issues. The Naval CINC logistics planners review and approve subordinate inputs, incorporate the data and requirements into the Navy plan, and represent the Navy CINC to resolve shortfalls, deconflict issues, and develop comprehensive and feasible logistics annexes to the OPLAN or OPORD. In the event of a Navy OPORD or General Operation Order (OPGEN), the Navy CINC planners follow the same basic process, but without a requirement for JPEC refinement. Navy CINC logistics planners often request and receive planning support from subordinate commands and supporting CINCs.

Planners for the numbered fleets, or other command levels below the component commander, develop detailed logistics requirements. The numbered fleet commander considers the level of supported forces, the timing of their arrival, planned movements, projected operations tempo and the distance and capabilities of potential support sites and maintenance facilities. Detailed support requirements and shortfalls are determined from these considerations. The CINC then incorporates these results in the final product, a detailed logistics concept of support. The Navy commander at this level—through his logistics staff and planners—may have responsibility for joint logistics coordination within theater, and will be concerned with both Navy and common-user theater stocks and services. Planning and coordination of support sites, contracting, facilities, forces, and equipment for shore-based operations are conducted in detail, as are planning for CLF and COD/VOD support of afloat forces. Numbered fleet or component commanders will task subordinates for appropriate planning data, and may receive logistics planning assistance from supporting commands.

Transportation planning assumes a minor role for initial deployment of most ships. While sustainment requirements bring the afloat force into competition for limited strategic transportation assets, the transportation feasibility of ships' movement during the deployment phase of an operation is almost always assured. Initial requirements for every logistics function are transported with the supported force. Endurance loaded ships may operate for weeks with minimal external support.

Naval units at sea must also place planning emphasis on theater infrastructure and lines of communication (LOC) issues. Theater infrastructure concerns do influence planning with regard to ports and facilities for shore-based support, maritime prepositioning force (MPF), assault follow-on echelon (AFOE), and logistics over the shore (LOTS) operations; and other strategic sealift discharge. Forces afloat must also be concerned with characteristics of the theater regardless of land or sea. Political and topographical concerns become relevant during projection of power into national waters, airspace, or territories. Where political or other conditions prohibit effective placement of support sites, planners must ensure available logistics force ships can provide support across extended shuttle legs. Conversely, the support of ships at sea is complicated by specific environmental (wind/sea state) impediments to resupply, and broader threat spectrums (including subsurface as well as surface and air). The U.S. Navy excels at underway replenishment (UNREP), but weather, threat, or operating conditions can render UNREP impossible at times. Planners seek to prevent support shortfalls by ensuring necessary support in spite of natural or enemy action.

Shore-based Naval logistics introduces additional planning requirements. Sites must be identified for the advanced logistics support sites (ALSSs) and forward logistics sites (FLSs). Capacities, layout, equipment, and competing requirements determine the throughput the sites can accommodate, and the logistics forces necessary to support that throughput. Plans are structured using ABFCs. These planning tools are functional groupings of personnel, material, facilities, and equipment. Each ABFC has a defined capability, and a list of requirements necessary to its support. Multiple ABFCs are combined to meet the mission requirements of each site, with personnel ABFCs providing the necessary skills being married to equipment/facility ABFCs providing the necessary capabilities. ABFC requirements may be met from units and equipment sets in the active component, the Naval Reserve, or from other sources. Navy organic shore based logistics forces are concentrated in the Naval Reserve, and planners must consider the need for early access to reserve units and equipment (both active and reserve) for every functional area of logistics. Additionally, the plan must provide for sustainment and security of the logistics forces and sites since many expeditionary shore-based Navy logistics forces are not fully self-sustaining.

Logistics planning within the battle group generally addresses near-term operations and emergent requirements. The battle force logistics coordinator

and staff will plan and develop operation tasks (OPTASKs) promulgating days of supply, logistics staff responsibilities, replenishment priorities, logistics reporting, and coordination of support within the battle force and with the underway replenishment group and shore-based logistics organizations. Existing shore-based logistics commands generally participate in OPLAN development by generating and providing relevant data and/or supporting plans to the Navy component commander. For Navy ships, logistics planning is driven by the direction received in instructions and OPTASKs from each level of command. Supply, Weapons, Medical, and Engineering Officers maintain directed levels of supply, and exercise judgment within prescribed parameters.

Marine Corps logistics planning reflects the tradition of operations from the sea, focusing on its expeditionary nature. Expeditionary operations ashore generally require establishment of forward bases and creation of a theater logistics system. Expeditionary operations generally involve five phases of action: predeployment, deployment, entry, enabling/decisive actions, and redeployment. Planning for predeployment addresses logistics, interfaces, FSSG support to the deploying MAGTF, civilian support, mobilization personnel requirements, fiscal authority, facilities, and remain-behind equipment. Deployment planning defines deployment support organizations, JOPES validation, deployment modes, movement control organizations, and continuing support from parent bases and stations. Entry planning includes amphibious operations, MPF operations, air contingency MAGTF operations, Marine Operations other than War, or any combination of the four. Enabling/decisive planning considers sustainment through lodgment for logistics and other support capabilities, sea basing requirements, the need for the sea echelon, and the potential to transition to sustained operations ashore. Finally, reconstitution planning provides for potential follow-on missions and redeployments.

Multinational Planning

Economic, military, environmental, and other crises seldom confine themselves to a single nation. The U.S. unified, subunified, or joint task force (JTF) commander normally acts within the U.S. chain of command to prepare both unilateral plans and joint plans in support of treaty or alliance commitments. Within the combined chain of command, the U.S. commander and component commanders coordinate these plans with coalition or alliance plans. The principles guiding operational and logistics planning

within international organizations are much the same as those within joint and naval planning, and logistics remains a national responsibility under allied doctrine. However, certain planning considerations gain significance in multinational planning. The following are representative of areas the naval logistics planner must address:

- ◆ Chains of command proliferate, and lines of authority and responsibility must be understood. This relates to all levels of command. It reflects the need to know not just command and control organizations, but also responsibilities for functional and site operations. Equally important is advance agreement on procedures for adjudicating conflicts that may arise between countries.
- ◆ National security interests must be maintained. Certain information within joint and supporting plans will not be necessary to the planning or execution of the combined operation, and will not be releasable to allies or coalition members. The scope and level of information to be released will be in accordance with CJCS instructions.
- ◆ Planning and reporting requirements, methods, and formats must be determined. This is frequently established in allied doctrine, but may vary in different operations. Planners must recognize and incorporate these requirements in planning logistics command and control.
- ◆ Logistics interoperability must be addressed. While logistics is a national responsibility, the principles of economy and simplicity require cooperative agreements. These agreements allow more efficient use of resources and minimize the logistics footprint in theater. Differences in areas like health services or food service between the support acceptable by one nation, and available from other nations may be completely irreconcilable. While issues such as processing standards, sanitation practices, and water or fuel quality provide common examples of this problem, other considerations can be just as critical; common or shared support of combined forces can be extremely difficult when cultural or religious beliefs impact sustainment.

NATO Logistics Support

Planning takes place within the NATO Operational Planning Process (OPP), and produces detailed logistics Annexes to the NATO OPLAN and

OPORDER. Within NATO maritime forces, specific logistics planning may be promulgated through OPTASKs. The NATO planning process and products bear great similarity to the U.S. equivalents. A primary difference is the need for continuous national consultation and international coordination during planning. Memoranda of Understanding (MOU), bilateral agreements, joint Host Nation Support Agreements (HNSAs), Status of Forces Agreements (SOFAs), funding, transfers of authority, national contributions, NATO-owned equipment, and other questions must be addressed. The principal source of unity of effort, consensus, and economy is a series of Logistics Planning Conferences involving NATO Commanders and nations. These conferences result in logistics procedures and a command and control architecture to be employed in the operation.

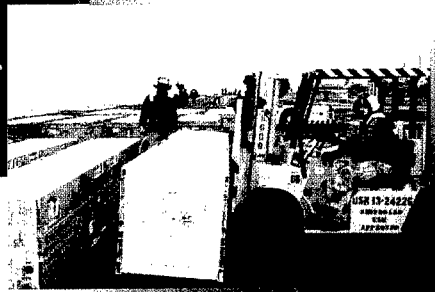
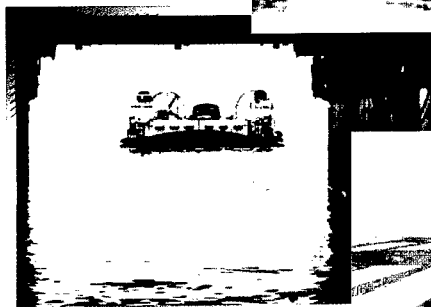
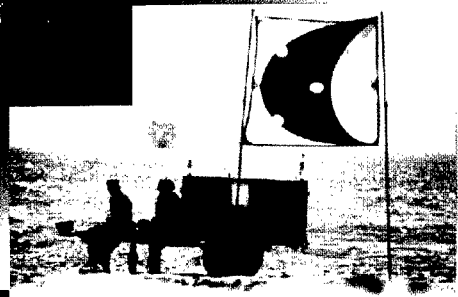
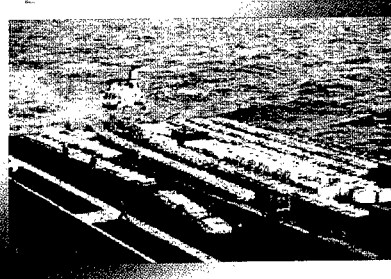
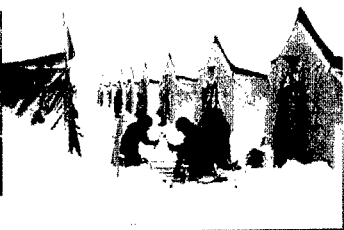
Conclusion

Planning operations at the Service, joint, or multinational level requires tremendous amounts of data. For logistics planning, this data involves every aspect of an operation that may affect distribution and sustainment. Analysis at every level of logistics, for each element, within each function, must be thorough and accurate. Incorporating every consideration from the strength of the enemy to the location of a reserve unit in the middle of the U.S. is an almost incomprehensible task. Effective planning depends on the rapid accumulation and processing of data into information that can support the operational commander in making the right decision. To this end, sophisticated information systems link operations and support planners at every level to each other and to the information they need. Naval and joint planners rely on JOPES and supporting systems identified in the next chapter to produce feasible plans and time-phased force and deployment data (TPFDDs).

Logistics planning extends from the deckplates to the National Command Authorities, and to international alliances and organizations. Attention at every level assures consideration of factors ranging from the operating needs of the forces to the limits of the industrial base. At higher organizational levels planning becomes more complex, yet more productive; economies and capabilities shared within and between units, forces, services, and nations afford the warfighter increasing access to responsive, flexible support. Feasibility is enhanced as joint and combined assets address common needs. Disciplined planning efforts draw each advantage from cooperative support, thereby minimizing waste and redundancy. At

execution, the products of logistics planning multiply the effectiveness of the force and the confidence of the combatant commander.





CHAPTER THREE

Logistics Command and Control Systems

"A sound logistics plan is the foundation upon which a war operation should be based. If the necessary minimum of logistics support cannot be given to the combatant forces involved, the operation may fail, or at best be only partially successful."

—Admiral Raymond A. Spruance, USN
Commander Fifth Fleet, 1946

Introduction

Naval commanders monitor and direct forces through command and control (C2) systems. C2 systems are bolstered by information systems offering reliable data and the organizational and analytical tools to manipulate that data in support of effective decision-making. The command and control and information systems used to monitor and direct naval forces and operations, including naval logistics forces and operations, function under national authority and within a joint command and control system to permit effective coordination and employment of forces. Additionally, naval forces may be assigned to combined forces. In this mode, naval command and control systems connect to allied systems, and naval information systems share with allied systems that information necessary for combined operations, consistent with U.S. security considerations. Effective logistics support requires commanders at every level of supported and supporting forces to understand the organization and associated information systems of naval, joint, and combined forces.

Development of joint command and control, and information systems is progressing rapidly. Commonality and interoperability have assumed a higher priority than ever before. Advances in C2 have been made possible by advances in information and communications technology, and divergent approaches to command and control are drawn closer by computer processing power and electronic media. Advances in C2 extend to command and control of naval logistics (Log C2), and supporting information systems.

Command and Control of the Armed Services

The NCA controls the operating forces through designated commanders in chief exercising combatant command (COCOM) of assigned forces. COCOM is vested in geographic and functional unified (all Service) commands with broad continuing missions. Two additional levels of joint force commands are subordinate unified commands and the JTF. The JTF is the “workhorse” organization for joint response to an emergent crisis with a specific limited objective.

Naval Service Organizations

Although forces may be assigned or reassigned between unified CINCs, they remain permanently organized within the Services. The Secretary of the Navy (SECNAV) exercises authority, direction, and control of those Navy and Marine Corps forces *not specifically assigned to combatant commanders*. The SECNAV directs and controls naval forces through the Chief of Naval Operations (CNO) and the Commandant of the Marine Corps (CMC). The Department of the Navy organizes, trains, equips, and provides forces for the combatant commanders, and maintains administrative control (ADCON) of those forces. Administrative control is exercised through the commander of the cognizant Navy or Marine Corps component command.

The CNO and the CMC are the senior Navy and Marine Corps officers respectively of the Department of the Navy, and are members of the Joint Chiefs of Staff (JCS).

Forces and assets under the CNO administrative control include Navy operating forces and the Navy shore establishment. Navy component commanders working under the unified CINCs report administratively to the

CNO. In this chain of command, they train and equip the operating forces. These commanders include the major fleets—the Atlantic Fleet (CINCLANTFLT) and the Pacific Fleet (CINCPACFLT)—and the commanders of U.S. Naval Forces Europe (CINCUSNAVEUR) and U.S. Naval Forces Central Command (COMUSNAVCENT). Also included are commanders of the Naval Reserve Force (COMNAVRESFOR), the Operational Test & Evaluation Forces (COMOPTEVFOR), the Naval Special Warfare Command (COMNAVSPECWAR), and the Military Sealift Command (COMSC).

Under the USMC organization, the CMC is administratively responsible to train and equip the Marine Corps forces under its two main organizations, Marine Forces Pacific (MARFORPAC) and Marine Forces Atlantic (MARFORLANT).

Operating Force Organization

Operationally, Navy geographic component commanders report to the unified CINCs for their areas and command Navy operating forces and activities within their geographic areas. These operating forces are organized in numbered fleets. The Commanders of the Third Fleet and Seventh Fleet report to CINCPACFLT, while Commander, Second Fleet reports to CINCLANTFLT. Additionally, Commander, Sixth Fleet reports to CINCUSNAVEUR, and Commander, Fifth Fleet reports to COMUSNAVCENT. As units enter an area of responsibility for a specific Navy CINC, they CHOP (change of operational control) to the appropriate numbered fleet. Within the fleet, forces are further organized into task forces (TF), task groups (TG), task units (TU), and task elements (TE) as appropriate. These organizations may be naval, joint, or combined. In joint or combined task operations, the senior naval commander may be the combatant commander or may serve as component commander to the task organization.

Operationally, Marine Corps Operating Forces are assigned to combatant commands through the Marine Corps component commanders. The Marine Corps established combatant command-level Service component commands include MARFORPAC and MARFORLANT. To provide three-star, general officer representation to the remaining three geographic combatant commands, COMMARFORLANT is designated as the Marine Corps component commander to both CINCUSEUCOM and CINCUSSOUTHCOM.

COMMARFORPAC is designated as the Marine Corps component commander to CINCUSCENTCOM and Commander, U.S. Forces Korea (COMUSFK). The Marine Corps operational organization is focused on the MAGTF. Each MAGTF contains a Command Element (CE), a Ground Combat Element (GCE), an Aviation Combat Element (ACE), and a Combat Service Support Element (CSSE). There are four basic types of the MAGTF:

- ◆ **The Marine Expeditionary Force (MEF)** consists of a command element, and at least one Marine division (MARDIV), a Marine aircraft wing (MAW), and a force service support group (FSSG). Any of the three MEFs may deploy minus portions of its structure, or plus units from other MEFs, Services, or the Reserve.
- ◆ **The Marine Expeditionary Brigade (MEB)** consists of a command element, two to five reinforced infantry regiments, a composite Marine aircraft group (MAG), and a Brigade service support group (BSSG). A MEB may deploy as an amphibious force, maritime prepositioning force, or an air contingency MAGTF.
- ◆ **The Marine Expeditionary Unit Special Operations Capable [MEU(SOC)]** is the standard forward-deployed organization, routinely found in an Amphibious Ready Group (ARG). The MEU(SOC) normally includes a command element; a reinforced infantry battalion with artillery, engineer, reconnaissance, armor, and assault amphibian units; a reinforced squadron with transport, utility, and attack helicopters; a detachment of vertical/short takeoff and landing fixed-wing attack aircraft; and a task organized MEU service support group (MSSG).
- ◆ **The Special Purpose MAGTF (SPMAGTF)** may be formed with narrowly focused capabilities chosen for a specific mission. Normally, the SPMAGTF will be at or below the size of a MEU(SOC).

Naval Logistics System Organization

Naval logistics forces fall within the same overall command and control structure as operating forces. Forces in theater are assigned to the operational control (OPCON) of the supported CINC. The logistics organizations, systems, and forces are both components and customers of the overall logistics system. Regardless of location or employment, all logistics forces rely on supply and transportation systems to distribute their own

support and to fuel the support they provide. Joint, naval, and multinational organizations often co-exist and interact to provide effective theater logistics command and control.

Theater Logistics Command and Control

Logistics command and control in theater is the responsibility of the combatant commander, while logistics support is a Service responsibility. The combatant commander normally accomplishes control of naval logistics operations through the naval component commander. Dependent on the size and nature of operations and assigned forces, there may be either Navy (NAVFOR) or Marine Corps (MARFOR) component commanders, or both. Naval forces afloat, including Marine forces, will likely be OPCON to NAVFOR. Marine Forces afloat may receive common-item logistics support via the NAVFOR. Conversely, Naval forces landed in support of ground operations, which may include Navy forces, will be likely OPCON to MARFOR and may receive common-item logistics support via the MARFOR. Also, a joint force commander may designate JTFs sourced entirely from a single Service, or from functional components of several Services. Naval organization for effective logistics support is predicated on the nature of the forces supported, and may be tailored to specific theaters and operations.

The joint force commander (JFC) will determine his appropriate Log C2 organization based on the mission, operating environment, and assigned assets. This organization will manage common-user and cross-Service logistics, monitor and report logistics operations and capabilities, advise the combatant commander on logistics matters, and represent the command to external logistics organizations. Regardless of what specific form the organization takes, it will generally constitute or include a Logistics Readiness Center (LRC). The logistics staff will focus its monitoring, advising, and internal and external coordinating activities within this center. While the joint logistics C2 structure may take many forms, most can be categorized within three primary models:

- ◆ Augmented log organization, represented in Figure 3-1, utilizes the existing J4 organization as the theater Log C2 organization. This logistics staff, augmented as necessary by the relevant Services and Agencies personnel, extends its role beyond the internal staff logistics functions to provide coordination and tasking for joint force logistics.

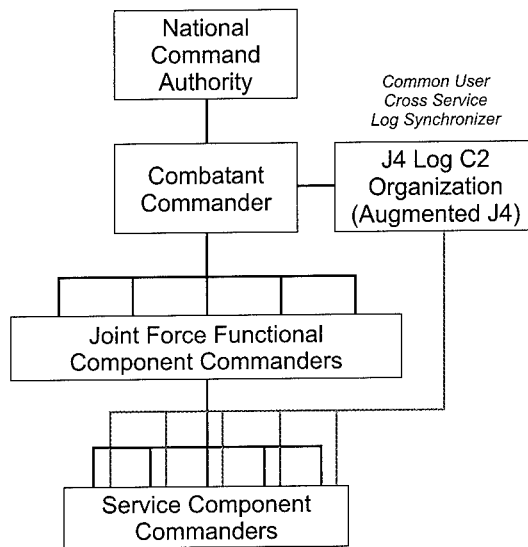


Figure 3-1. Joint Logistics Augmented Organization

- ◆ In a second organizational form, shown in Figure 3-2, a separate J4 focuses mainly on internal logistics, and a Log C2 tasking and coordinating position is created on the CINC's staff. Jointly staffed by the Services and Agencies, this organization can be activated and expanded as dictated by mission requirements.
- ◆ For missions or areas where one Service represents the majority of the capabilities or requirements, the combatant commander may organize Log C2 by tasking the predominant involved Service's logistics agency with managing and coordinating joint requirements. Service and Agency liaison will be provided to represent component requirements. An example of this organization is depicted in Figure 3-3.

Naval Theater Logistics Command and Control

Naval Log C2 organization for forces afloat is often supported across multiple lines of communication from sites both within and without the operating area. These sites may be under control of different numbered fleet commanders. The forces afloat can also move in and out of the CINC's area of responsibility (AOR), drawing sustainment from changing CINC's as they transit the ocean. Shore-based forces in theater have different support requirements than forces afloat, and in some theaters may fall under

Logistics Command and Control Systems

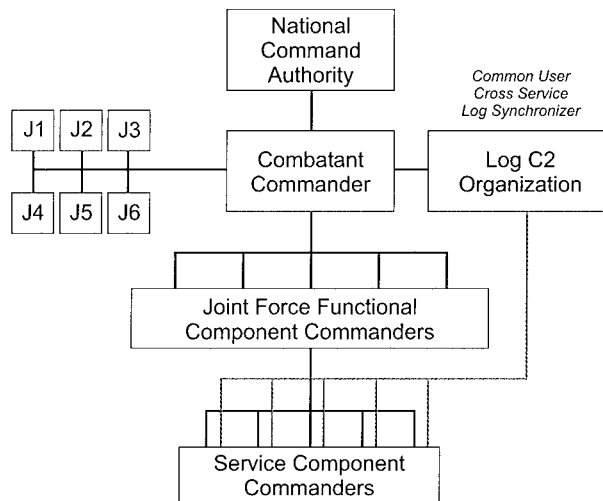


Figure 3-2. Joint Logistics Stand Alone Organization

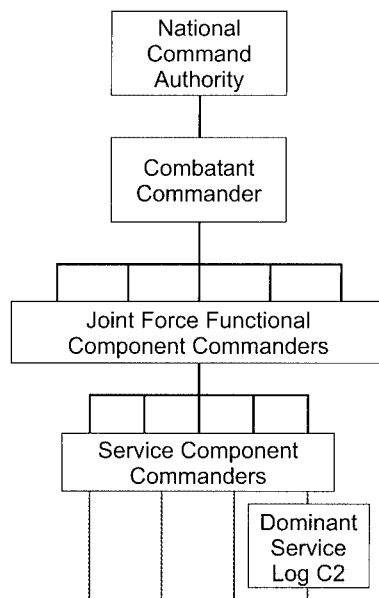


Figure 3-3. Joint Logistics Dominant Service Organization

different Service Log C2 organizations. Certain Navy forces ashore may be reassigned between Navy and Marine Corps (or other-Service) control, shifting support responsibilities. Finally, Marine Corps forces afloat shift substantial support requirements from Navy to Marine Corps logistics organizations when they go ashore. These challenges demand very flexible, but very well defined, Log C2. Like the unified CINC, the Navy fleet CINC has the three similar options for Log C2 organization.

The logistics forces of each numbered fleet overseas are organized into a standing task force. The commanders of these task forces act as the principal logistics agents for the Fleet Commander. They control assigned CLF shuttle ships; plan resupply of ordnance, fuel, and repair parts; and plan and manage theater ship repairs in military and commercial yards. In some cases, the numbered fleet logistics task force commander may be “dual-hatted” on the CINC Fleet staff. In other cases, the Navy component commander may control logistics forces that are not assigned to a numbered fleet.

Logistics Command and Control Ashore

Navy expeditionary shore-based logistics forces include those assigned to the Navy component commander and those assigned to the Marine Corps forces. Navy expeditionary shore-based logistics forces not assigned to Marine Corps forces will normally be incorporated into logistics sites in theater. Commanders of these sites will report to the Navy component commander through the NCC’s logistics C2 organization. Sites under NCC operational control include the ALSS and FLS central to Navy theater distribution. While an ALSS or FLS will include airfields and seaports, Navy logistics forces will normally be tenants at these facilities, and will control only those forces and facilities specifically belonging to or given over to the Navy. Potential command and control options for terminal operations include:

- ◆ Existing U.S. bases with common-user port and terminal operations under AMC (air) or MTMC (sea).
- ◆ Existing U.S. bases operating common-user terminals under AMC or MTMC within port facilities under host nation civil or military control.

- ◆ Existing U.S. bases with port and/or terminal operations under Service control.
- ◆ Expeditionary common-user terminals under AMC or MTMC control, normally located in ports operated and controlled by host nation civil or military authority. This could include ports operated under combined commands.
- ◆ Expeditionary Service terminals located in ports under host nation authority. For Navy terminal operations, these are generally constituted from appropriate ABFCs to provide terminal operations and related support. This could include expeditionary terminals under combined control within host nation ports.
- ◆ Foreign civil or military ports without U.S. terminal operations, with or without an ongoing U.S. liaison presence. This circumstance most often occurs when a ship or unit calls at a port where U.S. forces do not normally operate.

Operations conducted in the absence of ocean terminals include MPF operations, amphibious operations, and LOTS/JLOTS. MPF operations will be conducted through ports when available, but the organizational foundation of the operations remains the same. MPF operations require an aerial port of debarkation (APOD) for offload of two fly-in echelons (FIE). At the seaport or beach, the Naval Beach Group (NBG) commander becomes commander of the Naval Support Element and directs cargo offload operations. During amphibious operations, the NBG supports the landing. A landing force support party (LFSP) is task organized from the NBG, Transportation Support Battalion, and other Navy organizations to provide initial combat service support. In JLOTS, the JFC will designate a JLOTS commander. Naval responsibilities will be as defined by joint doctrine and the JLOTS commander, and are generally influenced by the Service composition of the forces and sustainment being throughput.

Naval logistics forces including medical battalions, dental battalions, medical logistics companies, and construction battalions also support MAGTF operations. These forces operate under the Marine Corps theater logistics organization. The COMMARFOR may establish a MLC to facilitate reception, staging, onward movement, and integration (RSOI) and provide operational logistics to Marine forces. MLC is a task organization option, not a permanent organization. A FSSG may be assigned the

resources and responsibility for MLC functions, based on the operational situation, geography, C2 (for both tactical operations and logistics), and infrastructure requirements. During deliberate planning the MLC supports the identification, preparation, and submission of host nation support, interservice support, and intertheater and intratheater requirements for the Marine Service component. The FSSG designated as the MLC deploys early to support arrival, assembly, and initial CSS missions to the MEF until its own CSSE can be established. The MLC then conducts general support and interfaces with other theater logistics agencies.

Marine Corps command and control of non-aviation logistics in the MAGTF is through the CSSE that may be a FSSG or subordinate element. All organizations in the MAGTF have limited logistics capability—when that capability requires augmentation, the CSSE provides combat service support. The CSSE commander takes direction from the MAGTF commander.

The Assistant Chief of Staff, Logistics (AC/S G-4) has staff cognizance for logistics, and identifies logistics requirements, recommends logistics priorities, and coordinates external support. As the MAGTF and its CSSE are task organized, the CSSE commander may use various C2 options. The FSSG commander may form a subordinate CSS Detachment (CSSD), centralizing control by giving the unit a general support mission, decentralizing control by giving the unit a direct support mission, or attaching the CSSD to the supported unit. The Assistant Chief of Staff, Aviation Logistics Department (AC/S ALD) coordinates aviation maintenance, aviation ordnance, aviation supply, and avionics for the MAGTF's ACE with the Marine Aviation Logistics Squadron (MALS). The ACE also possesses organic ground logistics capability in the Marine Wing Support Group (MWSG). The commander of the MAGTF may realign tasking and responsibilities between the CSSE and the MWSG to maximize overall effectiveness.

Logistics Command and Control Afloat

The commander of the afloat forces will exercise control of logistics through a Fleet Logistics Coordinator (FLC), Task Force Logistics Coordinator (TFLC), or Task Group Logistics Coordinator (TGLC). Guidance and direction for Navy logistics operations derives from OPGEN promulgated by the Navy operational commander to set general policies and

procedures. An OPORD may be issued at various command levels to provide direction for specific operations. More specific guidance is provided by a series of OPORD appendixes or OPTASKs.

Multinational Theater Logistics Command and Control

Command and control of logistics during combined operations is similar to joint command and control. Command and control of multinational logistics operations requires the commander and staff to be aware of the parallel national organizations involved, and to foster good relationships with national representatives at appropriate points within those “stovepipes.” A few of the major complicating factors in multinational operations follow:

- ◆ Combined operations can greatly multiply the overlapping organizations. As an example, defense of the Korean peninsula is entrusted to Service components reporting to a joint commander (CINCUSFK) working within a Republic of Korea/U.S. Combined Force Command (CFC) bilateral alliance that coexists with the United Nations Command (CINCUNC).
- ◆ Sovereign nations will not always give Multinational Force Commanders (MNFCs) operational control of their forces. When operational control is given, it may be accompanied by restrictive conditions that severely limit the commander’s flexibility in employing the forces. This extends to logistics forces; OPCON may be extended to the MNFC, or limited directive authority may be granted.
- ◆ When OPCON over forces is granted, it does not automatically extend to logistics resources. Multinational operations do not provide directive authority over logistics unless specifically granted. Specified commanders within NATO are granted logistics redistribution authority to meet critical operational needs, but this is severely qualified.
- ◆ Forces are generally committed to multinational operations because of a community of interest; the military objectives of the force align substantially with the political objectives of the participants. Sovereign authority over forces, even those OPCON to the MNFC, supersedes any other.

The diversity of coalition or alliance members can be further complicated by the introduction of non-member nations into alliance operations. Ad hoc coalitions in response to emergent crises bring no C2 organization with them. It is assumed that when the U.S. is the coalition leader and dominant participant, U.S. joint or Service C2 organizations will prevail, but even willing coalition partners may sometimes lack the logistics robustness, interoperability, technology, or discipline to allow easy integration.

NATO Organization

There has been substantial success in developing combined command and control doctrine and procedures. NATO is the premier example of combined C2 for alliances involving many nations. As a standing organization that includes numerous members, operates in multiple theaters, and executes multiple types of missions, NATO reflects most of the challenges inherent in development of formal C2 for combined operations. NATO relies on a civil/military structure. Each member nation sends permanent ambassadors to the civil forums, and military representatives to the Military Committee. The highest civil forum is the North Atlantic Council (NAC). The Military Committee (MC), which is one of several committees established under the authority of the NAC, is the highest military authority in NATO. NATO's upper level military structure is depicted in the NATO Logistics Handbook.

Forces assigned to NATO are task organized. Operational control passes to the Combined Joint Task Force (CJTF), but the United States does not relinquish command of its forces. The OPCON of forces does not entail control of logistics, which must be specified. When a CJTF is formed, the CJ4 is responsible for logistics coordination. NATO Multinational Maritime Force (MNMF) doctrine requires member host nations to establish and operate necessary ALSSs or FLSSs. Afloat support refers to logistics support ships providing sustainment, medical services, and repair support to MNMF ships underway or at anchor. Ashore support involves necessary sites, facilities, and forces to provide logistics support to the MNMF.

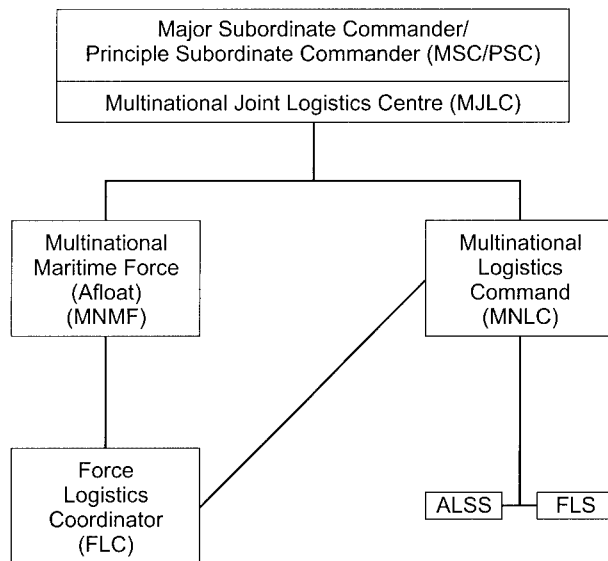


Figure 3-4. Multinational Logistics Organization

Command and Control of Afloat Support to the Multinational Maritime Force

Component forces may establish Multinational Logistics Centres or Commands (MNLCs). The MNLC for shore-based support of maritime operations is established as a command because of the requirement to command subordinate sites. This command relationship is reflected in Figure 3-4. Land or air MNLCs are established as centers, and are limited to coordinating authority.

Command and control of afloat support to the NATO MNMF is similar to U.S. Navy practices. The MNMF Commander assigns a Force or Group Logistics Coordinator (FLC/GLC) to ensure logistics readiness. The U.S. Navy commander within the MNMF will assign a Logistics Coordinator (LC) to provide coordination with the FLC/GLC. The Force Logistics Coordinator plans and executes MNMF afloat logistics policy, monitors inventory, and controls movement of sustainment to and within the task force or task group. The FLC is the Commander's direct liaison to the MNLC for shore-based support. The NATO afloat logistics command structure is pictured in Figure 3-5.

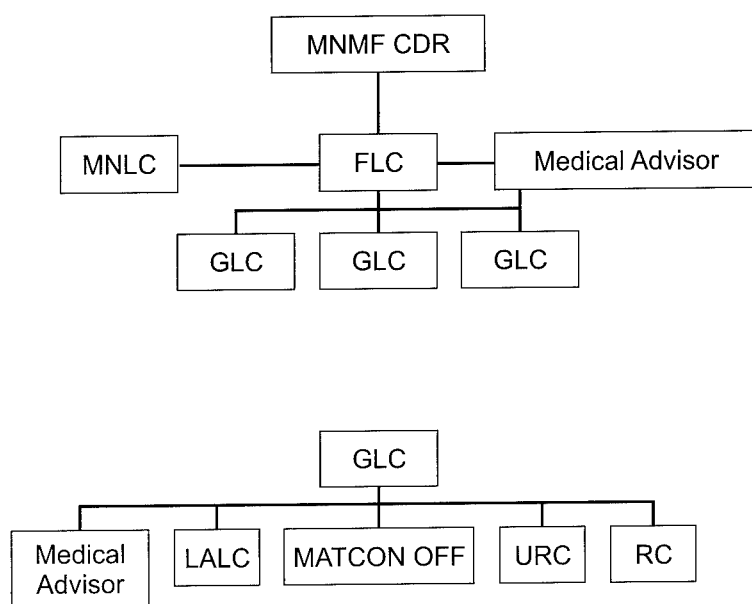


Figure 3-5. MNMF Afloat Support Organization

Command and Control of Shore-Based Support to the Multinational Maritime Force

Consistent with agreement between NATO Military Authorities and involved nations, the Multinational Logistics Commander (MNLC) controls and coordinates assigned shore-based logistics support forces. These include assets of the ALSS, FLSs, theater airlift, VOD, and shuttle tankers. The MNLC will normally report to the NATO commander exercising OPCON of the Multinational Maritime Force. Shore-based theater distribution within NATO is very similar to the hub and spoke system operated by the U.S. Navy, but when an ALSS or FLS is established within a member nation, the commander of that site will be drawn from that nation. This facilitates cooperation and communication between NATO sites and the host nation, and often allows NATO to rely on existing capabilities with minimal startup delay.

Logistics Information Systems

Logistics command and control depend on the identification and communication of planned and actual support requirements, and the

identification and application of logistics assets to meet those requirements. Conceptually, the quality of asset management determines whether scarce logistics resources can “stretch” to provide effective support. The commander, planner, or logistician is constrained by the accuracy and timeliness of available data. Such data is only useful when collected, analyzed, and refined into relevant information. Information systems enable every element, and support each principle of logistics. Information technologies have changed the way naval logisticians do business by fostering more efficient application of limited logistics resources. Increased emphasis on interoperability of equipment and standardization of procedures has allowed naval commanders and logisticians to lend to and gain from joint, other Service, and multinational logistics capabilities. The combined impact of the various systems in place and coming into service provides our naval forces with definitive advantages in planning, command and control, and operation of our logistics system.

Global Command and Control System (GCCS) and Other Primary Joint and Naval Logistics Information Systems

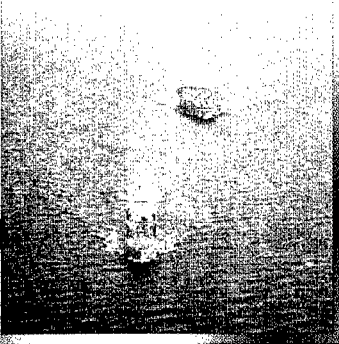
Global Command and Control System (GCCS) is the primary comprehensive automated command, control, communications, computers, and intelligence (C4I) system. It provides a worldwide network of military and commercial systems supporting information exchanges between the NCA, combatant commanders, and component commanders. Over 100 other major logistics information systems are in use by the Armed Forces, but as standardization continues, more systems feed common databases. The use of two emerging joint deployment information systems has been approved in an effort to enable the 72-Hour Time-Phased Force Deployment Data (TPFDD) time standard for deployment and provide operational capability in the near-term. The Transportation Coordinator's Automated Information For Movement System II (TC-AIMS II) will be the near-term joint single-source data system, and Joint Force Requirement Generator II (JFRG II) will be the near-term joint single-source feeder system for capturing and feeding unit movement requirements information into JOPES. TC-AIMS II will exchange unclassified Organizational Equipment List (OEL), Unit Deployment List (UDL), and Unit Movement Data (UMD) files with the JFRG II. GCCS is the C2 migration system to bring Service systems together; in this sense, all legacy and migration systems that support or access the common data bases are “part of” GCCS. Many systems play some

part in joint and naval logistics. Naval distribution is supported by numerous information and communication systems, offering management of inventories, movement, requirements, and other aspects of supply and transportation. These systems enhance distribution at every level of operations. Various systems at DLA, Service, and commercial locations provide the backbone of continental United States (CONUS) logistics, and support global distribution. Functionally specialized systems support disbursing, engineering, medical, repair, ordnance, fuel, and other operations. Together, these systems form an increasingly integrated network of information and decision support focused on effective logistics. NATO utilizes the Allied Command and Control Information System (ACCIS) for this function.

Conclusion

Adequate information about the availability and location of support—together with information on the physical and operational environment constraining distribution or execution of that support—allow maximum responsiveness and economy. By squeezing the most support from the available assets, effective command and control can positively influence overall efficiency of the logistics system. Likewise, a warfighter with reliable information on his logistics support can achieve the required level of confidence at a lower level of supply. Thus, excess stocks and requisitions are avoided, allowing the logistics information to serve as both an enabler and a product of logistics command and control. Naval logisticians will always depend on effective command and control to achieve maximum support from minimum resources, facilitating effective decision-making.





CHAPTER FOUR

Naval Theater Distribution

“A real knowledge of supply and movement factors must be the basis of every leader’s plan; only then can he know how and when to take risks with those factors, and battles are won by taking risks.”

—Napoleon, ca. 1805

Introduction

Expeditionary naval forces provide mission capabilities that can quickly reach and maintain station anywhere on the oceans, littorals, and airways. Exceptional mobility and sustainability mark the unique role of naval forces. Supply, engineering, transportation, maintenance, health services, and other services facilitate this readiness and thus the effectiveness of naval forces. A sound distribution system incorporating supply and transportation systems is critical for this sustainability.

The Distribution Components of the Defense Supply System

The greatest volume of materiel support is generated within CONUS through the defense supply system. This network of agency and service organizations includes the DLA, the GSA, Service supply systems, and miscellaneous DOD agencies. Primary naval components of this network are NAVSUP, Marine Corps Materiel Command (MARCORMATCOM), and NAVMEDLOGCOM.

Within the defense supply system, Integrated Materiel Managers (IMMs) are designated as the single point for acquisition and management of each item. This reduces redundancy and waste, and encourages economies of scale. DLA is the IMM for most items consumed by the Services. Exceptions generally fall into the areas of ordnance, major end items (ships, aircraft, and major equipment), repairables, cryptological material, and items with special circumstances dictating Service management.

Logistics support of operating forces is a Service responsibility, and each service maintains supply systems tailored to organic requirements. These systems are network components of the defense supply system. For the naval services, the primary supply systems are the Navy supply system and the Marine Corps supply system.

The Naval Supply System

The Naval supply system consists of NAVSUP, other naval organizations providing supply support, and organic supply capabilities of the operating forces. CINCPACFLT and CINCLANTFLT determine requisitioning channels for fleet units. These channels are coordinated with NAVSUP shore station channels, and are changed to reflect operational and distribution requirements.

NAVSUP conducts overall supply system management through an Inventory Control Point (ICP) and Fleet and Industrial Supply Centers (FISCs), and has responsibility for supply, disbursing, food services, postal services, and exchange services, as well as materiel transportation management. NAVSUP provides supply support to Navy forces, coordinates Navy participation in the defense supply system, establishes Navy supply methods and procedures, and provides certain contracting support. NAVSUP is organized functionally, with the following major components.

- ◆ Naval Inventory Control Point (NAVICP)
- ◆ Fleet and Industrial Supply Centers (FISC)
- ◆ Fleet Materiel Support Office (FMSO)
- ◆ Naval Transportation Support Center (NAVTRANS)

- ◆ Navy Petroleum Office (NAVPETOFF)
- ◆ Naval Ammunition Logistics Center (NALC)
- ◆ Navy Field Contracting Service (NFCS)

Other naval organizations providing significant supply support include:

- ◆ NAVMEDLOGCOM is the Navy and Marine Corps subject matter expert for medical materiel, and procures all medical and dental equipment, services, and supplies for naval forces.
- ◆ NAVFAC provides initial outfitting of chemical, biological, and radiological defense (CBR-D) material and equipment to overseas shore installations, and NCF and NBG units.
- ◆ SPAWAR provides software support for the fleet logistics programs that automate supply, inventory control, maintenance, and financial management.

The Marine Corps Supply System

The MARCORMATCOM has responsibility for materiel life cycle management of Marine Corps ground weapons systems, equipment, munitions and information systems. MARCORMATCOM exercises materiel support management through its two subordinate commands, Marine Corps Logistics Bases (MARCORLOGBASES) and Marine Corps Systems Command (MARCORSYSCOM). Together, these Commands plan, manage, and control the acquisition and sustainment of these systems. To properly sustain these systems, the Marine Corps executes its supply functions via wholesale and retail material management entities. At the wholesale level, MARCORLOGBASES performs traditional DOD inventory control point (ICP) functions for assigned items, as well as serving as the single service level manager for all Marine Corps ground weapons systems. At the retail level, Marine Expeditionary Forces (MEFs) operate intermediate stockpoints and process requisitions generated by the consumer level maintenance and supply systems. The Supply Battalions of the Force Service Support Groups (FSSG) operate these stockpoints and provide the primary source of supply for MEFs. The Navy provides support for Navy furnished material, ammunition, and equipment through cognizant SYSCOMs.

The Defense Transportation System

The Defense Transportation System (DTS) provides global transportation. The DTS includes military and commercial assets, systems, and services of the Department of Defense, including those contracted or controlled by DOD. The DTS does not include Service-unique assets or those assigned to a theater CINC. The Commander in Chief of the U.S. Transportation Command (USTRANSCOM) is the unified commander designated as the DOD single manager for common-user transportation. USTRANSCOM manages military transportation through three component commands: Air Mobility Command (AMC), Military Traffic Management Command (MTMC), and Military Sealift Command (MSC). In addition to their roles as component commands of USTRANSCOM, these are major commands of the Air Force, Army, and Navy respectively. Assets controlled or operated by USTRANSCOM components include a wide range of military, domestic commercial, and foreign commercial. The ability to readily access commercial capacity for continuing operations and surge requirements permits economical deployment of a responsive and flexible transportation system.

As the naval component of USTRANSCOM, MSC operates the Strategic Sealift Force to provide surge and sustainment shipping, and prepositioning. Organic common-user sealift ships are part of this command and operate in reduced operating status, and can be activated on four days to full status. MSC responsibilities include negotiation and procurement of sealift ships, and activation and oversight of Ready-Reserve Fleet (RRF) ships (in coordination with Maritime Administration (MARAD)). MSC also schedules DOD controlled shipping, coordinates required ship services with port authorities, and maintains availability and status data on MSC-controlled ships. MSC supports joint deployments with Afloat Prepositioning Ships, stocked with materiel and supplies for all Services. Army rapid deployment requirements are addressed by the MSC Large Medium Speed Roll-on/Roll-off (LMSR) ships and Fast Sealift Ships (FSS).

In addition to USTRANSCOM components, the DTS includes other government agencies that manage or administer civil transportation assets. These include:

- ◆ The Maritime Administration (MARAD) supports and oversees the U.S. Merchant Marine. In addition it owns and manages the Ready

Reserve Force (RRF) ships. These ships are available for activation and employment in strategic sealift operations. RRF ships in active service are under the operational control of the Military Sealift Command. MARAD also requisitions ocean shipping and coordinates activities with the NATO Defense Shipping Authority for allocation of NATO sealift assets to meet U.S. requirements during a NATO contingency.

- ◆ The Coast Guard provides safety and security of shipping, waterways, harbors, and ports. The USCG has civil law enforcement authority to ensure water safety, navigational safety, and vessel inspections, maintains aids to navigation, and licenses merchant mariners. The USCG is unique in that it is a military service, that upon declaration of war or presidential direction, changes operational control from the Department of Transportation (DOT), to the Department of the Navy.

The Naval Transportation System

Naval organic transportation assets are concentrated in sealift and airlift assets and with minimal land transportation assets. NAVSUP controls and oversees Navy materiel transportation through the Naval Transportation Support Center (NAVTRANS). This center provides Navy shippers with management guidance, provides limited mobile Navy overseas air cargo terminal, serves as the Navy shipper service representative to other transportation components, provides Navy airlift/sealift cargo requirement forecasts, and controls the Navy's Service-wide Transportation account.

The CNO and the CMC set policy for organic airlift. Navy organic transportation resources are heavily concentrated in the Naval Reserve, and the CNO has designated the Commander, Naval Air Reserve Force as executive agent for organic logistics aircraft. Limited aircraft are under the scheduling and administrative control of a variety of major Navy and Marine Corps claimants, providing direct support for major commands. Organic airlift assets provide a range of peacetime support in CONUS and overseas, but they are provided specifically to meet approved emergency or wartime requirements for organic support. All Navy and Marine Corps transport aircraft fall into the category of Operational Support Airlift (OSA). The Joint Operational Support Airlift Center (JOSAC) uses data supplied through the Joint Air Logistics Information System (JALIS) to schedule theater support aircraft, including some Navy and Marine Corps assets. OSA includes operational support aircraft (such as those assigned to

the major claimants), Navy-Unique Fleet Essential Aircraft (NUFEA), COD/VOD aircraft, Marine Corps helicopter and refueling aircraft operating in support of landing forces, and other miscellaneous aircraft. NUFEA and COD/VOD aircraft are assigned to Fleet CINCs to provide theater airlift support. Such support is not intended to replace common-user airlift; it is to provide specific support of fleet operations. Most commonly, fixed-wing medium transport aircraft will operate between the ALSSs and FLSs, supporting the COD/VOD operations from those sites to the fleet at sea. NUFEA aircraft also support deployment, redeployment, and sustainment of shore-based naval forces.

CLF ships provide strategic transportation during initial deployment, and are capable of providing additional emergency strategic lift. Similarly, hospital ships and prepositioning ships act as defense stockpoints, strategic transporters, theater transporters, and combat service support providers. With these various assets, a full range of strategic and theater distribution functions is possible with limited or no theater shore-based support. While forward basing, fixed or expeditionary, is critical to support maneuver and provide economy of operations and throughput capacity, naval forces afloat are able to maintain station anywhere.

The Logistics Pipeline

The flow of logistics support to the operating forces has often been depicted as a flow through a pipeline channeling support from sources (most commonly CONUS-based acquisition), through nodes (bases, stock points, fixed and expeditionary sites, etc.), to the end user (forces). This pipeline is illustrated in Figure 4-1. Personnel and materiel flow from seaports and airports of embarkation (SPOE/APOE) via strategic lift. This strategic phase of distribution ends at the aerial port or seaport of debarkation (APOD/SPOD) in theater. RSOI of forces commences at these nodes. Theater distribution entails both operational and tactical logistics. Once at the end user, logistic resources, unless expended, must reenter the logistics pipeline in the reverse flow during redeployment, disposal, or other retrograde actions.

Acquisition decisions have traditionally limited overseas purchases. Consequently, overseas purchases for afloat forces were limited to consumable supplies and port and intermediate maintenance services. Planners and operational commanders now place greater emphasis on the use of

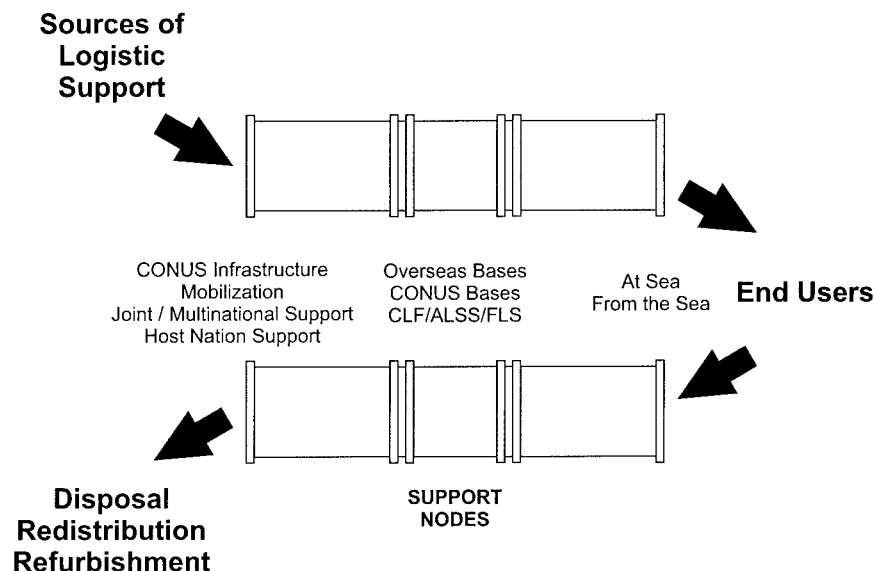


Figure 4-1. Naval Logistics Pipeline

host nation, allied, coalition partner, or other foreign support reducing throughput through the naval logistics pipeline. Civilian contractors—domestic and foreign—directly provide support previously accomplished by the Services.

Transportation modes for the pipeline are selected based on mission need, capability, transportation priority, regulatory restrictions, and available capacity. Regulatory restrictions include transportation and storage issues such as hazardous material regulations, and security and custody issues such as registered mail regulations. Strategic transportation choices include a range of military and commercial options, both foreign and domestic. The combatant commander's options for operational (theater) lift extend across services, modes, allied services, and host nation or other nation capabilities.

Selection of the service support provider at point of issue in theater is straightforward for the naval forces afloat, but vary significantly for shore-based forces. Tactical service support is normally under Service control. The majority of common-user items will be requisitioned by an organic supply organization for issue within the operating unit. However, as

directed by the CINC, shore based naval forces may utilize common-user, other-Service, combined, contract, host or other-nation, or small purchase options to effect tactical delivery of a commodity or service.

Disposition requires a reversal of the flow through the network and involves the same considerations and participants as during sourcing the resources. Collection services, modes and nodes of redistribution, and disposal services form a near-mirror-image of the acquisition, distribution, and sustainment elements. Disposal activities include survey and local destruction, environmental cleanup, consignment to local disposal sites, transfer to allies, coalition partners, non-governmental organizations (NGOs), or private voluntary organizations (PVOs), and redeployment. With multiple options at each step in the process, the logistics network provides the combatant commander, planner, and logistician with a complex decision matrix. Any number of sources may be matched to varying transportation modes and nodes at successive points en route to multiple tactical users. The overall goal of the logistics network is to deploy forces and sustainment in the accomplishment of assigned missions.

Force Projection

Force projection is the doctrine under which U.S. armed forces are employed in overseas missions. Joint doctrine identifies five activities in force projection. They are Mobilization, Deployment, Employment, Sustainment, and Redeployment. These generally parallel the four logistics process elements that support and enable the employment of forces. Figure 4-2 depicts these parallels. Deployment and redeployment are of critical interest to the operational commander or logistician in theater. Mobilization—concerned with the acquisition, assembly, and organization of assets—is primarily a strategic activity that the operational commander will be able to influence only in indirect or incidental manners. Sustainment is received at the tactical level out of services and supplies distributed to the end user.

Strategic Distribution and Force Projection

Strategic distribution is the movement of forces, materiel, and personnel to the theater of operations. In force projection doctrine, deployment is the movement of forces and their sustainment from point of origin to an end user in a specific operational area. Deployment takes place in four phases.

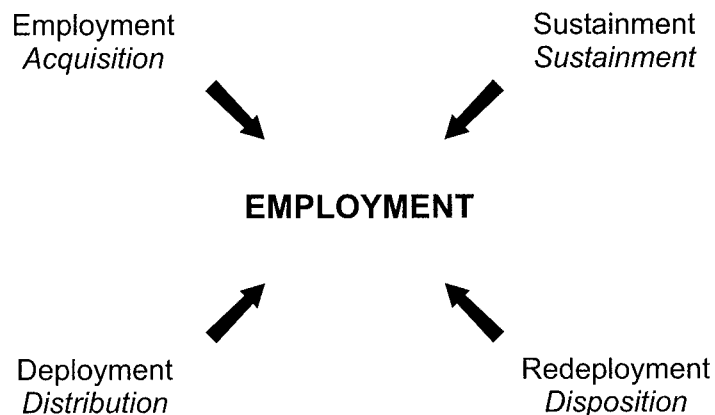


Figure 4-2. Force Projection: The Logistics Process

- ◆ The first phase is predeployment activities that begin at the point of origin, and include planning and preparations required to prepare units and materiel for deployment. For deployments requiring strategic movement, this normally means movement of materiel or forces to a seaport or airport, and preparation for loading. CONUS, MTMC will coordinate commercial movement requirements with Service transportation authorities. Substantial Navy and Marine Corps forces including reserves and war reserves will deploy through this phase. For OPLAN execution, the POE for each movement of sustainment or forces is designated in the TPFDD.
- ◆ The second phase is the movement from the POE in CONUS or elsewhere to the theater POD. This is the strategic transportation phase of deployment. Most Navy operating forces are self-deploying, as are the War Reserve Material (WRM) and ships of the MPF. Shore based naval forces and sustainment requiring strategic movement will rely on DTS for this phase. Normally, movement from the POE to the POD involves sealift or airlift, but movement of materiel and forces between theaters can be by land or inland waterway. TPFDD development and refinement in the planning process is critical to apportioning available lift. Material, forces, and personnel are loaded at the POE in accordance with established transportation priorities, and load and storage limitations. When the strategic lift arrives at the theater POD and is downloaded,

strategic movement is complete and the final phase known as RSOI begins.

- ◆ The third phase, theater distribution, commences when forces or sustainment arrive at a POD. This “arrival” can occur administratively when WRM prepositioned ashore in theater is broken out. For terminals with significant throughput for naval forces, the Navy and/or Marine Corps will normally assign appropriate liaison or forces to ensure accurate identification and rapid handling of their respective resources. At aerial ports, this will often entail the deployment of an Air Cargo Company (ACC), element-sized and configured to the projected throughput with appropriate terminal operation capabilities present. The MSC will establish offices at ocean terminals to support MSC controlled ships and operations. The Navy Cargo Handling and Port Group (NAVCHAP-GRU), Navy Cargo Handling Battalions (NCHBs) and other expeditionary units may be assigned to support aerial and sea port operations. Common-user SPOD operations will normally be under MTMC control, and will be operated by Army, civilian, host nation, joint, combined, or Navy forces.
- ◆ RSOI is the final phase of the deployment process in force projection. RSOI of Navy and Marine Corps forces and sustainment may occur through service, joint, or combined organizations. The relevance of RSOI is more evident for forces ashore than for forces afloat or items of supply. All deploying forces and sustainment are subject to this sub-process of force deployment, and may undergo varying forms or degrees of these steps:
 - ◇ Reception is receiving and accounting for components of force and sustainment at the theater POD. Reception includes reporting of receipt that updates in-transit visibility.
 - ◇ Staging involves the assembly of personnel, equipment, and supplies and preparation for onward movement. For Navy shore-based forces this entails “marrying up” with unit equipment shipped separately or drawn from WRM, and task organization of forces for projected employment. In MPF operations, it involves the merging of Marines and the NCF with their offloaded equipment and supplies.
 - ◇ Onward movement is the theater movement of forces and supplies toward their final destination. This includes self-transport by Marine

and supporting Navy forces, organic delivery through the Navy hub and spoke system, or consignment to joint or combined delivery modes.

- ◇ Integration includes the remaining steps necessary to make the forces or sustainment ready for employment. Forces report to their operational commander in the operating area and establish required Service, joint, or combined communications and reporting processes. Forces “plug in” to non-organic (Service, common-user, cross Service, host nation, or commercial) service support providers as appropriate.

The Hub and Spoke Concept of Navy Theater Distribution

Navy theater distribution is accomplished through a hub and spoke system. Non-self-deploying forces transit this system on their way to employment, and all Navy forces receive sustainment through this system. See Figure 4-3.

Primary Hubs Ashore – The Advanced Logistics Support Site

The primary theater distribution hub is called an ALSS. The ALSS centers on the availability of an aerial port and seaport in relative proximity. An ALSS normally possesses the capabilities to receive, store, consolidate, and transfer the full range of required support for forward-deployed Navy forces. An ALSS is stood up at military or civilian sites using a mix of active and reserve units augmented by contract, host nation, and allied and coalition support. These units cover required logistics functions, as well as administration and support of the ALSS itself. Tenders and hospital ships can also augment an ALSS.

Onward movement from the ALSS may be via organic or contracted local delivery; organic, common-user, or combined theater airlift; CLF shuttle ship; common-user or combined ground or water transportation; customer pickup; COD; or organic, contracted, or VOD. This movement is directed to the next transshipment point or to the end user.

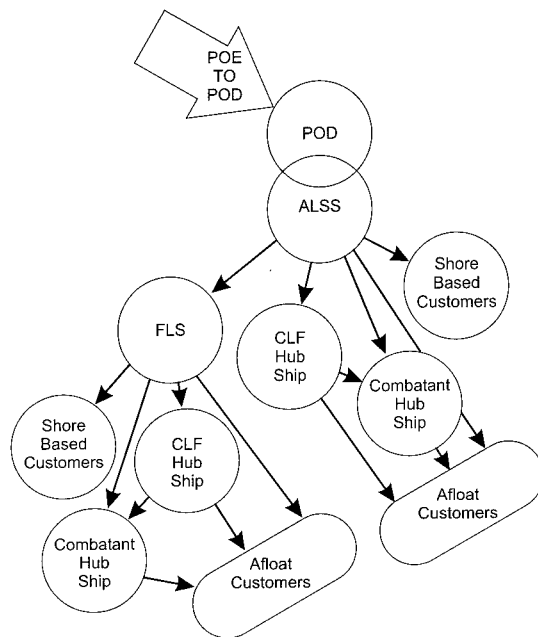


Figure 4-3. Hub and Spoke Distribution

Secondary Hubs Ashore – The Forward Logistics Site

The final transshipment point ashore in theater is the FLS. A FLS is usually closer to the operating forces than the ALSS, and capabilities may range from very austere to nearly as capable as an ALSS. Naval expeditionary logistics units and equipment, host nation, and contracted resources are task organized and assigned based on established and anticipated support requirements. FLSs normally include both a seaport and airport, but may have only one or the other when appropriate to the support requirement or site availability. While most logistics flow is from the ALSS to the FLS, FLSs may receive direct shipments into the theater in response to operational emergencies. FLSs are expeditionary and are established, moved, and disestablished readily in response to movement of the supported forces.

The final spoke in distribution can be via CLF ship to afloat forces by local issue within the ALSS/FLS, or by surface delivery from the ALSS or FLS for nearby customers and ships in port. Similarly, customer pickup—usually by ship's organic helicopters or by shore based

customers—may complete operational distribution. For forces at sea, distribution may proceed through direct delivery or through an afloat hub. Navy COD aircraft provide direct links from the closest FLS or ALSS to carriers at sea. COD is usually reserved for the highest priority passengers, mail, and cargo (PMC). Weight, size, and cube are strictly limited on COD aircraft, so both the volume and nature of support via COD is very restricted. COD overheads are often cancelled due to offensive and defensive operations or training, weather conditions, or other more urgent requirements of the carrier or battle group.

VOD aircraft offer another option for direct delivery of high priority PMC from the FLS or ALSS to ships with adequate helicopter facilities. VOD has commonly been accomplished by Navy heavy helicopters, but other-Service, allied, and commercial aircraft have proven capable of operating to and from Navy ships with proper aircraft and crew certification and standardization of procedures. Considerations in VOD are generally similar to those involved with COD. Range limitations of COD/VOD aircraft are driving forces in the placement of FLSs. Introduction of V/STOL capabilities promise to significantly increase speed and range in some future VOD operations.

Hubs and Spokes Afloat – Replenishment at Sea

To accomplish effective support at sea, the Navy establishes hubs afloat. These hubs carry or receive PMC for transfer to other ships at sea. Replenishment at sea, primarily through UNREP, is done by moving materiel across rigging between two ships (CONREP) or by military or commercial helicopter (VERTREP).

The primary hub for UNREP is the CLF ship. These ships are configured and equipped for cargo transfer to other ships underway. Other military or commercial vessels can be pressed into service by embarking cargo afloat rig teams (CARTs) to provide and operate temporary rigging for limited ship-to-ship transfers. Primary CLF ships involved in UNREP of supplies today are the T-AFS, T-AO, T-AE, and the AOE. CLF hub ships primarily receive materiel in port at the FLS, ALSS, or other supply point. The T-AFS is stocked to a specific plan—called a fleet issue load list (FILL)—for issue to requisitioning ships. In addition, the CLF ship will pick up freight for ships it will be replenishing. Dependent on operations, materiel availability, and logistics replenishment (LOGREP) schedules,

the T-AFS may also receive materiel from other CLF ships at sea. T-AOs and AOEs load petroleum products at defense energy supply points (DESPs) at the FLS, ALSS, or other locations in or near the theater. T-AOs and AOEs at sea also receive transfers from other oilers and point to point tankers; this is termed consolidation (CONSOL). T-AOs and AOEs also load ordnance at in theater U.S. ordnance facilities.

Combatant ships also serve as hub ships for specific support. Many ships cannot accept COD aircraft or heavy VOD aircraft. Delivery of high priority air-transportable PMC to these ships may be via COD/VOD to a carrier or VOD to another large-deck air capable ship (LHD/LHA). For VOD delivery, a CLF ship in company will normally perform as hub ship when available. When a CLF ship is not available, or when most of the VOD delivery is destined for the large deck combatant, the combatant will normally accept delivery of items for ships in company, with final transfer to be subject to operational considerations.

Tactical Distribution Within the Battle Group

Delivery to the final hub ends the operational level of theater distribution. Afloat units link directly to the supply system; they are individual customers that requisition directly, maintaining their own inventories and operating budgets. While different types and classes of ships have widely differing capabilities, basic combat service support is organic—self-contained and self-deploying with the ship; larger ships enjoy organic logistics capabilities ranging up to some intermediate level maintenance. Consolidated Shipboard Allowance Lists (COSALs), Aviation Consolidated Allowance Lists (AVCALs), and carefully developed and tested planning factors for endurance loading allow the efficiency of supply planning necessitated by finite storage limits. U.S. Navy afloat supply operations permit tailored, focused throughput of precise requirements. This, in turn, allows streamlined distribution featuring reduced logistics footprint in theater, minimal intermediate inventories, and negligible movement of superfluous supply to forward areas.

CLF ships within a battle force or battle group conduct tactical distribution during replenishment at sea, and other hub ships distribute PMC to ships in company as possible. LOGREP cycles are determined by the operational commander in response to operational requirements, unit locations, elapsed time since replenishment, and urgency of requirements. By

minimizing forward inventories and shore-based infrastructure, and providing the means to rapidly move sustainment to and between units in direct response to precise requirements, Navy tactical distribution and shipboard supply have predicted and practiced the future direction of joint logistics.

Tactical Distribution Ashore

Naval forces ashore rely on a combination of unit-organic, Navy fixed base, Naval Expeditionary Logistics Support Force (NELSF), contract, common-user, host nation, cross-Service, and multinational sustainment. As most Navy shore-based forces—other than those assigned to Marine Corps forces—will be within the ALSS or FLS, tactical distribution is largely confined to immediate issue or local delivery. Thus, while sourcing of sustainment may be very flexible and innovative, tactical distribution is generally simple and direct. Exceptions arise in areas where U.S. Navy shore-based operations are not in proximity to adequate support. An example is the remote and austere FLS with very limited organic capability; tactical distribution of support as basic as disbursing payments for local contracts can require periodic movement of support either down the operational distribution channels from the ALSS or back from supported forces. It is not uncommon for afloat forces to provide critical tactical support of remote FLSs. Such distribution is accomplished through local coordination between the FLS and either the ALSS or the afloat forces. The NCF, the medical force, and other Navy forces assigned to support Marine Corps units derive tactical distribution through Marine Corps channels.

Marine Corps tactical distribution ashore is accomplished through organic unit capabilities and units of the CSSE of the MAGTF. The Marine Corps identifies tactical logistics as the tactical-level execution of logistics functions by either CSS units or unit organic actions. The Marine Corps consider combat service support as intermediate support provided to units lacking organic capability. Marine Corps practice differentiates distribution to the unit as being either “unit” or “supply point” distribution. Simply put, this identifies whether the distribution system is responsible for delivery to the unit, or the unit is responsible for pickup at the supply point. Though seemingly a minor distinction, the selection between these two sources of tactical delivery has serious consequences for the transportation assets of both the supported unit and the CSS element.

Naval Theater Distribution in Multinational Operations

NATO has developed distribution procedures and policies allowing combined support. NATO naval operational logistics are similar to that of the U.S. and readily understood by U.S. naval logisticians. The information given above on hub and spoke theater distribution ashore and within the battle force generally applies to NATO maritime logistics operations.

The principles and policies of NATO establish logistics support as a collective responsibility, effected by the cooperation of the nations and the transfer of sufficient authority over logistics resources to enable effective employment and sustainment of forces. Implicit in this is an understanding that transfer of authority, or even transfer of a repair part, is voluntary and may be prevented or limited by national laws and interests. Nations are not required to solely use the multinational logistics organization. They may rely solely on national channels if available. In any case, provision of materiel support is a national responsibility, and supply items are requisitioned through national channels. For nations utilizing the multinational distribution channel, delivery to the ALSS remains a national responsibility. For U.S. forces, this translates to strategic distribution. National supply systems inform MNLC of all PMC en route. Once forces or materiel reach the ALSS, RSOI are the responsibility of the MNLC organization.

Host nation and multinational agreements for specific support will often result in substantial savings in distribution. Shared resources and shortened transportation legs made possible by these agreements allow a distribution system that is at once more responsive and more economical. Increasing commonality and interoperability of multinational supported and supporting forces continue to enhance this trend. Distribution through the multinational system economically offers the certainty of support necessary to mission accomplishment.

Conclusion

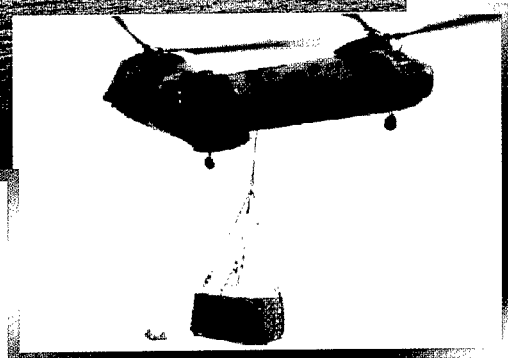
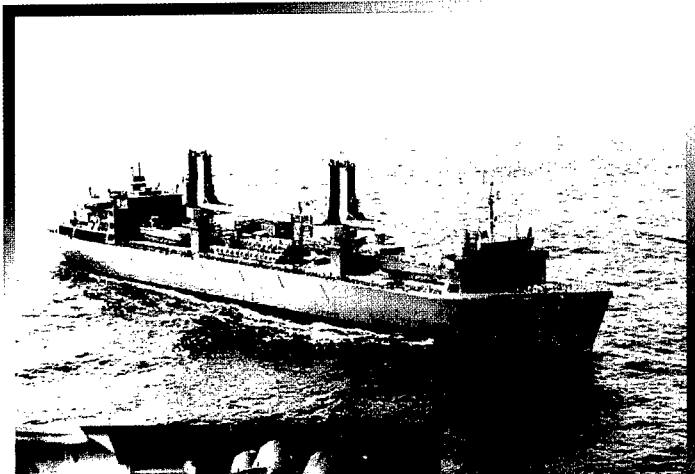
Our naval, joint, and multinational supply and transportation systems provide distribution services to U.S. naval forces around the world sustaining both operating and support forces. Well-defined and well-established acquisition systems fill the strategic pipeline with the wherewithal of military operations on and from the sea. The CONUS supply system and the

strategic transportation system respond to crisis by focusing their efforts on rapid achievement of attainability and sustainability.

Theater distribution operations can be complicated by a variety of factors: the competing requirements of other Services within the joint force; the political atmosphere of the host nation; as well as the potential needs of allied or coalition partners. For the storekeeper aboard ship, the customer remains constant and co-located. For the air cargo specialist at the FLS, the ship keeps moving. For the air cargo specialist at the ALSS, the FLS that serves the ship keeps changing, and even the FLSs themselves may move!

Unlike the CONUS and shipboard systems at each end of the pipeline, the theater distribution system may not pre-exist. It may form around existing theater structures, or stand up from scratch. It may incorporate existing bases, but will probably be expeditionary. It will be manned by forces drawn from some combination of active, reserve, joint, combined, and civilian sources. It will deploy quickly and commence operations with a mix of facilities and equipment drawn from many sources. Theater distribution to naval forces works because highly mobile and forward-focused Navy and Marine Corps forces have the backing of a deliberate, responsive, and robust infrastructure that operates under proven procedures to provide responsive support under all conditions.





CHAPTER FIVE

The Future of Naval Logistics

"No matter who carries the load in any fight—soldiers, sailors, airmen, or marines—they need to be supported and supplied from the sea."

—Admiral Arleigh A. Burke

Introduction

The basic nature of naval logistics has changed little over the years. The underlying principles of logistics are timeless and the process necessary to acquire and provide cruise missiles and gas turbines to the fleet are not different from those used to acquire and provide cannon balls and sails two hundred years ago. However, the complexity and impact of naval logistics have grown in response to changes in the complexity of supported forces and the expansion of roles and missions. This complexity and criticality is rooted in four ongoing patterns:

- ◆ **Complexity of the systems.** Intricate platforms and systems require specialized technical support. With operations dependent on fewer and more expensive deployed systems requiring more sophisticated support, the logistician is challenged to sustain each vital system on line via dependable and readily deployable resources.
- ◆ **Increased velocity of war.** New communications technologies have speeded the flow of information to the combatant commander. Advanced surveillance and weapons systems also contribute to the flow of information and the potential speed of reaction. The promise of this increase in velocity relies on the commander to be able to receive,

integrate, and evaluate information quickly and accurately, and to make sound, timely decisions based on the information. The urgency of this process stems from the need to achieve battlespace dominance, and to respond quickly to similar capabilities on the other side. This pattern of information acceleration compresses the time available for logistics planning and response and accelerates the decision process to be inside the enemy's decision cycle.

◆ **Expanded area of the battlespace.** Not only are operations conducted far from home, but the same technologies that shrink the world are expanding the battlespace. Just decades ago, decisive sea battles were fought in areas too small to contain a single battle group today. Targeting data that was once confined to line of sight is now generated globally. The naval logistician finds his customers dispersed and active over great areas, quickly and frequently shifting intentions, requirements, and locations in response to unfolding situations. Secure and accurate means of communication and transportation are a must.

◆ **Expanding mission requirements.** Additional types of missions and forces must be supported. The increased focus on military operations other than war signals a requirement for logistics support of varying customers and missions not traditionally military in nature. Simultaneously, new emphasis on joint, interagency, and multinational operations demands increasing cooperation, interoperability, and greater logistics flexibility in response to divergent requirements, sources, systems, and procedures.

These four patterns are not new; they have played a role in the evolution of naval logistics doctrine and practice for centuries. Naval planners, operators, and logisticians must continuously shape, anticipate, innovate, and lead the effort to improve doctrine, systems, and procedures. Operational commitments demand a focus on the effectiveness of force and the necessity of providing optimum readiness at the best overall value. Budgetary restrictions and other limitations on available assets demand a focus on the principles of economy and simplicity. Balancing these competing demands to produce leaner logistics systems delivering better support requires the attention of participants at all levels of the supported and supporting forces. Some of the most significant changes in logistics support requirements may come from change in the nature of the supported force. Reduced demand results from reducing the size and requirements of the supported force, and the size and requirements of the supporting force. If the supported force can be made smaller, if it can project its power to a greater

range, and if it can operate with less requirement for sustainment, reliable logistics support can be achieved more economically. Continuous improvement programs are bringing significant reductions in support requirements. Examples of areas subject to continuing improvement include the following:

- ◆ Increased force lethality allowing the combatant commander to deliver required combat capability from a smaller force level.
- ◆ Increased survivability achieved through active and passive defense and force protection allows the commander to reduce losses, reducing future sustainment requirements.
- ◆ Increased systems range may reduce force levels by permitting engagement at longer distances allowing smaller combat support and combat service support footprints ashore, with attendant savings in both force protection requirements and logistics support activity up the logistics pipeline. Challenges associated with sea-based fires time of flight and interruption of sea-based sustainment flow will continue to require a small presence ashore of combat support and combat service support, respectively.
- ◆ Weight and volume reductions permitting the same level of lethality, protection, detection, mobility, and communication from smaller, lighter systems.
- ◆ Improved maintenance cycles allow sustained operations with reduced requirements for repair parts, lubricants, maintenance supplies, etc.
- ◆ Increased reliance on not just U.S. naval resources as combined and joint operations become more and more common in our military engagement activities.
- ◆ Increased commonality and interoperability between the Services and combined force allows overall force levels to be reduced by eliminating redundancies in systems and support.
- ◆ Improved information access allows the commander the greater economy of force by permitting better and more timely command and control decisions.

- ◆ Use of effective force tailoring in deploying naval forces will reduce the traditional logistics footprint. Via containerized equipment, superfluous resources can be mitigated.

Reduced demand through these potential improvements and reductions of the supported force are made during the acquisition process and benefit both the supported and supporting forces. For example, extended maintenance cycles on vehicles used in both combat and support roles increase the efficiency and reduce the internal support requirements of logistics forces. Additional logistics system improvements are developed to foster increased efficiency, allowing a given level of logistics assets to sustain combat forces at higher optempo.

Every element of logistics, at every level and in every functional area, is a candidate for constant refinement. Improvements in preventive medicine and treatment may reduce the requirements to transport replacement personnel forward and casualties back. Streamlined and automated systems may reduce the number of personnel deployed forward to provide disbursing, legal, billeting, and other services; each such reduction lessens the number of personnel sustained forward. Advanced engineering products and systems can allow smaller engineering units to do construction and infrastructure maintenance faster and better. Improvements in diagnostic and repair systems and procedures allow fewer technicians to keep more systems online. In addition to the functional areas, continuing cooperative alignment and standardization of joint and allied logistics systems will facilitate improved logistics capabilities to be shared in combined operations. A variety of naval, joint, and allied initiatives recognize the opportunities inherent in doctrinal, procedural, and technical improvements; these initiatives set the focus and direction of Naval Logistics for the first part of the twenty-first century. Guiding many of these initiatives is Joint Vision 2010.

Joint Vision 2010

Joint Vision 2010 (JV 2010) establishes Focused Logistics as one of four principal operational concepts of future warfighting, as shown in Figure 5-1. Focused Logistics was established as an equal partner with Dominant Maneuver, Precision Engagement, and Full Dimensional Protection in establishing Full Spectrum Dominance of the battlespace. The realities of Dominant Maneuver, Precision Engagement, and Full Dimensional

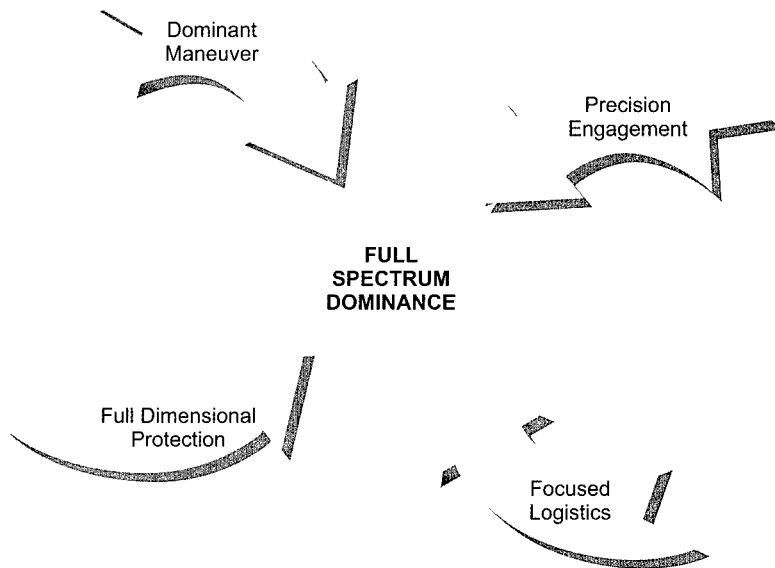


Figure 5-1. Establishing Dominance of the Battlespace

Protection offer both opportunities and challenges for the logistician. Each will require new standards of information availability and processing; much of this information will enable Focused Logistics.

Dominant Maneuver calls for synchronization of dispersed forces in sustained operations. Logistics customers will be spread out over broader areas, and may move more often and more rapidly. The logistician must seek ways to disperse functional capabilities and increase transportation capabilities. This ability may also result in more forces being based at greater distances, from the sea base to the objective. **Precision Engagement** will marry systems designed to locate, target, attack, and assess with greater accuracy and certainty. Precision Engagement will substitute knowledge for ammunition. Logistics efforts will focus on smaller quantities of smarter ordnance delivered to dispersed forces precisely where and when needed. However, savings garnered from lower expenditure rates may be offset due to increased cost of advanced munitions and systems, and the complexity of systems and sensors. Precision Engagement will rely heavily on advances in information technology. **Full-Dimensional Protection** will control the battlespace to ensure freedom of action and provide multi-layered defense of forces and facilities. Information superiority and interoperability will allow joint contributions to active and passive defenses. Reductions in support force and infrastructure attrition will enable

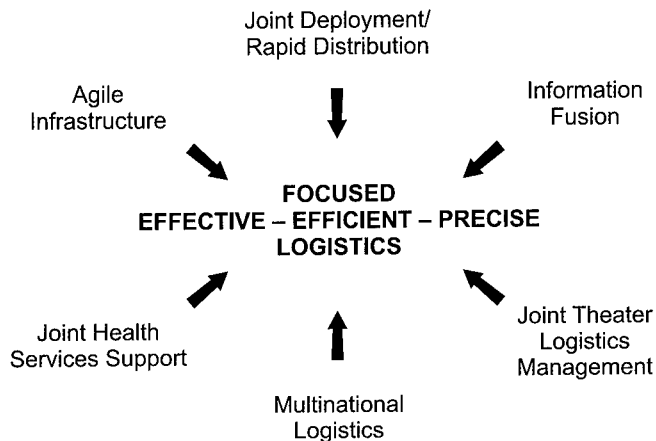


Figure 5-2. Focused Logistics

confidence in the survivability of the logistics pipeline, allowing less redundancy and excess stocks. **Focused Logistics** will integrate information, logistics, and transportation technologies to provide efficient logistics support and effective crisis response. It will provide tailored logistics at all levels of operations. By tracking and shifting assets as required, Focused Logistics will put the right support at the right place and time. This vision mirrors the traditional Navy and Marine Corps logistics operations.

Focused Logistics

Focused Logistics includes six tenets, as depicted in Figure 5-2. These are Joint Theater Logistics Management, Joint Deployment/Rapid Distribution, Information Fusion, Multinational Logistics, Joint Health Services Support, and Agile Infrastructure. These tenets combine to provide responsive support at any level and in any type of military operation, with reduced logistics response times, inventories, costs, infrastructure, and shortfalls.

◆ Joint Theater Logistics Management

Synchronization and sharing of Service logistics capabilities can reduce the logistics presence required to support joint operations. Joint Theater Logistics C2 is one alternative offered to provide clear lines of authority by assigning responsibility for logistics support in joint operations to a single entity. It would utilize common information to prioritize and allocate

scarce resources, eliminate redundant capabilities and stocks, and coordinate common-user and cross-Service support. Implicit in this management approach is a requirement for extensive integration of Service support systems and processes; full implementation of this concept will require changes in Service systems, and major advances in commonality and interoperability.

◆ Joint Deployment/Rapid Distribution

Joint Deployment/Rapid Distribution is the process of moving forces to the operational area and providing them with accelerated delivery of logistics support. This requires improved transportation and information networks; visibility and accessibility will squeeze maximum support from limited assets. Navy and Marine Corps doctrine will continue to emphasize the unique characteristics and contributions of operations on and from the sea, and Navy and Marine forces may sometimes forego specific process steps, but the steps and claimants in the Service deployment processes are recognizable and definable in joint terms. It will focus at the strategic level on continuing improvements in core sealift and airlift capabilities, en route infrastructure agreements and upgrades, and increased utilization of commercial delivery.

Among rapid distribution initiatives affecting naval logistics are the ongoing procurement LMSR ships for the Strategic Sealift Fleet and expansion of commercial sealift mobilization programs. Also, JLOTS initiatives will improve logistics support of shore-based forces in the absence of adequate port capacity. Advanced causeway and crane systems, lighterage, and other improvements, are currently programmed and being developed to increase throughput in rougher seas.

◆ Information Fusion

Information fusion will accomplish universal access to appropriate information through GCSS. GCSS will provide near-real-time logistics C2 and a common support picture through shared data and applications. The situational awareness and access to assets implied by network-centricity will extend to the logistics arena and ensure that reload and repair are as responsive and flexible as the operational maneuver they support. Eventually, third-party logistics will be integrated into GCSS. Such enablers as Automated Identification Technology (AIT), Joint Total Asset Visibility (JTAV), In-Transit Visibility (ITV), and Joint Decision Support Tools

(JDST) are in varying stages of deployment and development, and already impact logistics operations. Future Joint Decision Support Tools must accurately and rapidly track and update consumption rates to communicate precise requirements thus reducing the amount of unnecessary sustainment in the logistics pipeline.

◆ **Multinational Logistics**

Continuing evolution of support relationships between the U.S. and allies and coalition partners will yield stronger regional contacts, more effective multinational operations, and equitable distribution of logistics tasking and responsibility. Through multinational logistics initiatives, Focused Logistics will extend to combined operations many of the benefits currently derived from jointness. Efforts toward increased logistics cooperation amongst our allies are concentrated in four areas—common operational framework, expansion of bilateral agreements, interoperability through technology sharing, and leveraging the capabilities of multinational partnerships.

◆ **Joint Health Services Support**

Focused Logistics directs a joint health service support strategy (JHSS) supporting Force Projection with essential care in theater, robust aeromedical evacuation, and definitive care in CONUS. This care is oriented to ensure a healthy and fit force, to prevent casualties, and to administer effective casualty care and management. This enhances the warfighter's capability by providing and sustaining a healthy, mission-ready force on line, and by reducing lift requirements for deployment of replacements and disposition of casualties.

◆ **Agile Infrastructure**

Agile infrastructure will improve joint logistics policies, structures, and functional processes to permit maximum economical application of these options. The result will be reduced logistics forces, equipment, supplies, and facilities—all achieved with the overriding objective of maintaining effective support. The actions necessary to reengineer infrastructure and achieve more economical logistics support will rely on outsourcing requirements where practical and effective, instituting commercial business practices, improved engineering and maintenance support, enhanced inventory management, and increased prepositioning and war reserves. While

Contractor Logistics Support may be more economical, it may generate serious coordination or force protection problems in a wartime AOR.

Naval Logistics Concepts

The Navy and Marine Corps have developed concepts designed to support military operations through a wide range of options. These will be increasingly expeditionary, forward positioned, sustainable, maneuverable, and streamlined. Many components of Focused Logistics are already impacting naval logistics operations. Current and projected initiatives are expanding electronic connectivity, real time access to the common operating picture, and a current global inventory of logistics assets and activity. High Yield Logistics (HYL) charts this course for the Navy's logistics strategy in the new millennium.

High Yield Logistics

The Navy's vision of logistics transformation is captured in its HYL strategy. The strategy seeks to deliver the highest quality of service to our expeditionary forces throughout the world, while reducing the Navy's total ownership costs. High Yield Logistics achieves this transformation by fundamentally changing the way weapons systems are supported.

The plan's broad initiative is the reduction of the operating and support costs for fielded systems through technology insertion. By making funds available to purchase repair parts that are engineered for longer life and optimal performance through technology, the Navy is freeing up funds for modernizing weapon systems while maintaining readiness and sustainability.

The "High Yield Logistics" strategy attacks all aspects of logistics. It focuses on three primary objectives, which describe how the vision will be achieved.

1. Supporting the warfighter
2. Outsourcing
3. Optimizing.

The Navy plans to focus its logistics support dollars to achieve the high levels of readiness and sustainment that the warfighters demand.

The inventory and logistics support will be outsourced where industry is willing and capable of providing support. Finally, the Navy will aggressively pursue reducing redundancy within its remaining infrastructure to ensure that the funding will maximize readiness. The concepts of precision, information, transformation, and partnership focus naval logistics development within the framework of Focused Logistics.

◆ Precision

Precision is the watchword in the theater environment of the future. The right support must reach the customer when and where needed. Inventories must carry the needed items only. Logistics response time will decrease as inventories become more visible and management systems become more responsive. Depots must be sized and located to support the naval force without waste. Regionalization and consolidation process for depot and intermediate maintenance is already underway, and contractors and manufacturers will contribute through initiatives such as Life Cycle Support. Precision requires emphasis on joint operations and integration, with additional focus on the deliberate planning process to accurately determine and represent naval requirements and theater capabilities. Management of stocks, including WRM, must address sourcing, transportation, and positioning to maximize availability to naval or other supported forces.

Extensive and flexible sealift support must be available to place precise support where and when it is required. A distribution system relying on velocity to replace depth of stocks cannot afford a less-than-responsive transportation element. Strategic sealift enhancement through continuing addition of LMSR ships, and initiatives to ensure a successful National Defense Features program for the U.S. merchant fleet will support joint strategic sealift requirements. A follow-on CLF and naval integration into joint theater distribution will provide more efficient and faster distribution to the afloat forces. Enhanced logistics support of Marine Corps forces in the seabase will address improved support of operations from the sea.

Munitions management, including inventory reduction, revised positioning and storage, enhanced visibility, and uniform environmental protection will bring increased precision, economy, and efficiency. Modular organization of Fleet Hospitals, Naval Mobile Construction Battalions,

Navy Cargo Handling Battalions, Navy Air Cargo Companies, and other expeditionary shore-based forces will allow precision responses to support requirements in the theater. The initiative for Fleet Hospital detachments responds directly to the JHSS for mobile distribution of essential care delivery.

Marine Corps Precision Logistics initiatives will measure logistics response times and repair cycle times for analysis and reduction, adapt commercial business practices to logistics operations, and improve Marine Corps logistics distribution and information systems. The Marine Corps Materiel Command will address Marine Corps connectivity to theater distribution systems, improving access to precise support through joint, common-user, and cross-Service capabilities.

◆ Information

No single aspect of logistics has received more attention in the joint and multinational arenas than information. It is almost impossible to discuss any aspect of current or future operations without addressing the enabling power of information technology. Information will help identify and locate inventory, but it does not substitute for availability, delivery, or decision-making. The Naval Logistics Information Strategic Plan has been promulgated to streamline logistics processes, reduce life cycle costs, and create synergy of data.

Naval logistics information systems will be reengineered and reorganized to reduce costs and cycle times. Outdated processes will be changed or eliminated to increase efficiency. Enhanced asset visibility programs will join with regionalization and inventory-sharing programs to minimize inventory requirements. New programs, such as Initial Requirements Determination/Readiness Based Sparing, will revolutionize parts planning and management. Advanced diagnostic and training systems will be employed to ensure the system and the operators or maintainers are at peak performance. New concepts like the Configuration Management Information System will provide more current and accurate systems data for each major systems installation.

Information technologies of several types will be integrated toward an objective of seamless logistics. Proven "Smart Ship" enhancements will be incorporated in new construction and refit, and "Smart Ship" initiatives will be applied to new areas. Systems such as Continuous Acquisition and Life Cycle Support System (CALC) and Integrated Condition Assessment

System (ICAS) will be tied to acquisition and maintenance to explore opportunities for reduced life cycle costs. Naval distribution systems will be integrated with GCCS and GCSS to bring the Navy and Marine Corps into full partnership in joint force deployments.

◆ Transformation

To effect change, the Navy and Marine Corps will reevaluate materiel, maintenance, and facilities management with the specific goal of identifying additional opportunities for outsourcing, consolidation, or regionalization. Express delivery services, Prime Vendor and Direct Vendor Delivery, common-user and cross-Service logistics, multinational support, and contingency contracting reflect the ongoing transformation of naval logistics. Tomorrow's naval logistics distribution system will be characterized by a concentration of expeditionary military logistics capabilities in theater, and a concentration of economical, capable private sector capabilities in support.

◆ Partnership

Partnership focuses on integration of naval forces as good citizens. The global partnerships required to achieve theater success address both military and non-military issues. Key objectives of these partnerships include effective stewardship of our environment and human resources. Partnership involves every logistics function in timely environmental cleanup and comprehensive pollution prevention programs. It requires engineer support of environmental protection in facility and systems planning, integrated plans to protect the natural and cultural resources of naval installations, implementation of hazardous material control and management (HMC&M) at major bases, and inclusion of energy and environmental conservation factors in facility planning.

Seabased Logistics Concept

Navy and Marine Corps operational concepts such as "Forward...from the Sea" and "Operational Maneuver from the Sea" require bold departures in sustainment options. "Seabased Logistics" is a conceptual framework envisioning support of expeditionary Navy and Marine Corps shore-based forces from the seabase. The five primary tenets characterizing Seabased Logistics Concept are:

- ◆ **Primacy of the sea base** — over the horizon, reduced or eliminated footprint.
- ◆ **Reduced demand** — seabased support, technology improvement, lighter force ashore.
- ◆ **In-stride sustainment** — network-based, automated logistics for maneuver units.
- ◆ **Adaptive response & joint operations** — expanded missions, joint support.
- ◆ **Force closure & reconstitution at sea** — building and restoring combat power.

The full promise of Seabased Logistics is subject to development of new platforms and equipment, and solution of various problems in ship-to-objective logistics, selective offload, strategic logistics interface, seabased intermediate maintenance, and joint interoperability. While near-term realization of limited seabasing may be feasible, full implementation is many years away.

Concept Development

The benefit inherent in the above initiatives will be developed and verified through a process of concept development, experimentation and wargaming, and implementation. As an example, joint logistics developments are pursued through the logistics wargames. The Navy Warfare Development Command (NWDC) supports logistics initiatives through concept development, experimentation in its Fleet Battle Experiment series, and promulgation of validated doctrine through the Naval Doctrine and Navy Warfare Publication series. The Marine Corps Combat Development Command (MCCDC) performs a similar role through the Marine Corps Warfighting Lab (MCWL), leading to the Marine Corps Doctrine and Warfare Publication series. These and other joint and Service efforts direct development and implementation of capable, feasible, and doctrinally sound advances in logistics systems and practices.

Conclusion

The way forward for naval logistics will proceed through many concepts, evaluations, experiments, and changes to tactics, techniques, procedures, and doctrine. HYL's precision, information, transformation, and partnership will support implementation of Focused Logistics. U.S. naval forces will go on doing what they have always done—go anywhere, at any time, against any odds to provide certain, flexible, responsive, seabased execution of our national will. Through all of this, the principles of logistics will guide the planning, command and control, and execution of logistics support.

As new technology races ahead, the naval logistics forces are challenged to capture the benefits of technology, embrace it, tie into concepts and experiments, and, if it makes sense, put it into our doctrinal publications. As the world order continues to shift, our military missions will change. Through all of this and more, professionals of our naval services will continue to search for the next new way to make naval logistics more responsive, simple, flexible, economical, attainable, sustainable, and survivable.



GLOSSARY

The following term definitions are provided for use with this publication. For terms not listed here, the reader is directed to refer to either Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms or Navy Warfare Publication 1-02, Naval Supplement to the DOD Dictionary of Military and Associated Terms.

A

Advanced Base Functional Component (ABFC). A grouping of personnel, equipment, material, and facilities designed to perform a specific function at an advanced base. Where components contain material only, the operating personnel are supplied by other components. Housing and messing facilities, medical facilities, defensive ordnance, communication equipment, and, in many cases, power plants and water supply are not supplied with each component and are themselves service components to be integrated into an overall base plan. The functional components are given names to indicate their functions and unclassified code numbers, consisting of a letter and number combinations, for use in easy reference.

Automatic Identification Technology (AIT). AIT is the family of technologies that allow the collection and entry of data into computers without manual keyboard entry.

Aviation Combat Element (ACE). The MAGTF element that is task organized to provide all or a portion of the functions of Marine Corps aviation in varying degrees based on the tactical situation and the MAGTF mission and size. These functions are air reconnaissance, antiair warfare, assault support, offensive air support, electronic warfare, and control of aircraft and missiles. The ACE is organized around an aviation headquarters and varies in size from a reinforced helicopter squadron to one or more Marine aircraft wings. It includes those aviation command (including air control agencies), combat, combat support, and combat service support units required by the situation. Normally, there is only one ACE in a MAGTF.

B

Battle Force Intermediate Maintenance Activity (BFIMA). Consists of maintenance beyond that of the capability of the using unit, but not so extensive to require major industrial facilities or equipment. It is normally provided by a tender or a larger combatant ship such as aircraft carriers (CV/CVNs) or amphibious assault ships (LHA/LHDs) within the battle force.

Battle Force Logistics Coordinator (BFLC). Person designated by the battle force commander to coordinate all logistics within the battle force.

Battle Group Logistics Coordinator (BGLC). Person designated by the battle group commander to coordinate all logistics within the battle group.

C

Combat Logistics Force (CLF). Includes both active Navy ships and those operated by the Military Sealift Command within the Naval Fleet Auxiliary Force that carry a broad range of stores, including fuel, food, repair parts, ammunition, and other essential materiel to keep naval forces operating at sea for extended periods.

Connected Replenishment (CONREP). A method used by ships to replenish from other ships via high line. Cargo, personnel, and fuel hoses are transferred by use of high-tension wires.

Construction Capability (CONCAP). CONCAP is an extension of the Naval Construction Force. It is a civilian contractor that is used to provide augmentation in the theater of operations. The services can vary from providing a variety of professional civil engineering functions and oversight to that of actual construction activities. Contracts are usually established prior to a contingency and allow for a smaller military footprint in-theater.

D

Defense Logistics Agency (DLA). A supply support organization assigned management responsibility and control of items in common use by all military services. About 60 percent of the line items in the integrated

Navy Supply System are managed by DLA. These items are identified by a 9 in the first position of the cognizance symbol.

F

Fleet and Industrial Supply Center (FISC). Command organizations that furnish supply support to fleet units, shore activities, and overseas bases established in their mission. They are under the management of the Commander, Naval Supply Systems Command (NAVSUP).

Fleet Issue Load List (FILL). Consolidated listing of material to be carried onboard combat stores ships for the support of operating afloat forces to ensure maximum fleet readiness. It is based on actual past demands of those items most commonly requested by the fleet units.

Fleet Logistics Coordinator (FLC). Person designated by the fleet commander to coordinate all logistics within the fleet.

Fleet Material Support Office (FMSO). Located in Mechanicsburg, Pennsylvania, FMSO is responsible for maintaining demand data and load list changes, performing Inventory Control Point (ICP) functions, and designing shore-based inventory control systems.

Forward Logistics Site (FLS). An overseas location, with port and airfield facilities nearby, that provides logistics support to naval forces within the theater of operations during major contingency and wartime periods. FLSs may be located in close proximity to main battle areas to permit forward staging of services, throughput of high priority cargo, advanced maintenance, and battle damage repair. FLSs are linked to in-theater Advanced Logistics Support Sites (ALSSs) by theater airlift and sealift, but may also serve as transshipment points for inter-theater movement of high-priority cargo into areas of direct combat. In providing logistics support, FLS capabilities may range from very austere to near those of an Advanced Logistics Support Site. Also called FLS. See also Naval Advanced Logistics Support Site.

G

General Services Administration (GSA). Responsible for the cataloging and inventory control of 9Q cognizance material or nonmilitary items in general use by both military and civilian agencies within the U.S.

Government. Examples of 9Q items include general use office supplies, hand tools, and cleaning supplies.

Global Combat Support System (GCSS). Under development, GCSS promises universal secure access to logistics information, with interoperability across combat support and C2 functions. Designed to reliably provide the warfighter with one picture of combat support available across one net to any authorized user on any computer, GCSS will make possible near real time C2 of the logistics pipeline. GCSS will rely on many sources of logistics information to paint an accurate picture of logistics flow.

L

Logistics Civilian Augmentation Program (LOGCAP). Army contract program that allows for substitution or supplementation of military logistics forces by commercial service support.

Logistics Coordinator (LC). Person designated with the fleet, battle force, or battle group to coordinate all logistics for the respective units.

Logistics Readiness Center (LRC). This organization is the logistics staff that supports the combatant commander with command and control of logistics support. This staff will manage common-user and cross-Service logistics, monitor and report logistics operations and capabilities, advise the combatant commander on logistics matters, and represent the command to external logistics organizations.

Logistics Replenishment (LOGREP)

a. Logistics replenishment is the resupply of units within the battle group or battle force. The schedule is determined by the operational commander in response to operational requirements, unit locations, elapsed time since last replenishment, and urgency of requirements. Ships submit requirements in advance to allow for proper planning and effective utilization of logistics ships.

b. NATO information system, Logistics Reporting System (LOGREP) that supports information exchange in NATO logistics reporting. Provides peacetime updates to LOGBASE, and supports ADAMS and ACROSS.

M

Memoranda of Understanding (MOU). A MOU is a document that specifies actions and responsibilities to be performed by the provider and receiver but only in general terms. A MOU should be backed by an ISSA.

Multinational Joint Logistics Center or Commander (MJLC). In the NATO military structure, this organization assumes the responsibility for detailed logistics planning and execution. The MJLC will contain internal coordination centers for the major logistics functions.

Multinational Logistics Centre or Commander (MNLC). MNLCs are established by component forces within the NATO military structure if there is limited existing support. Land and air MNLCs are established as centers, and are limited to coordinating authority. However, maritime MNLCs are established as commands.

N

Naval Advanced Logistics Support Site (ALSS). An overseas location used as the primary transshipment point in the theater of operations for logistics support. An advanced logistics support site possesses full capabilities for storage, consolidation, and transfer of supplies and for support of forward-deployed units (including replacement units) during major contingency and wartime periods. Advanced logistics support sites, with port and airfield facilities in close proximity, are located within the theater of operations but not near the main battle areas, and must possess the throughput capacity required to accommodate incoming and outgoing inter-theater airlift and sealift. When fully activated, the advanced logistics support site should consist of facilities and services provided by the host nation, augmented by support personnel located in the theater of operations, or both.

Naval Construction Force (NCF). The NCF, otherwise known as the Seabees, are deployable naval military construction engineering units whose primary mission is to provide responsive contingency construction support for U.S. military forces in a given theater of operations.

Naval Mobile Construction Battalion (NMCB). An established naval construction unit, trained and equipped for general construction of an advanced base, including buildings, airfields, roads, waterfront structures, utilities, and fuel installations. It is an integral unit in personnel, housing,

subsistence, administration, and equipment and is infantry equipped for defensive warfare.

Naval Supply Systems Command (NAVSUP). Provides for and meets those material support requirements of the Department of the Navy within the assigned material support responsibility of the Naval Supply Systems Command. They provide supply management with policies, methods, and staff assistance to the Secretary of the Navy.

Naval Transportation Support Center (NAVTRANSSUPCEN or NAVTRANS). Provides worldwide transportation and physical distribution services for U.S. Navy afloat and ashore activities and manages the Service-wide Transportation (SWT) accounts for Navy transportation.

Navy Air Cargo Company (NACC). A Navy unit tasked with establishing and operating an overseas air cargo terminal in an expeditionary environment.

Navy Cargo Handling Battalions (NCHB). Naval reserve commissioned units tasked with loading and unloading all classes of cargo (except bulk petroleum) carried in Military Sealift Command controlled and chartered ships, in Air Mobility Command controlled aircraft, and operating limited ocean terminal and expeditionary air terminals.

Navy Cargo Handling and Port Group (NAVCHAPGRU). Navy's active duty, rapidly deployable cargo handling unit tasked with loading and unloading all classes of cargo (except bulk petroleum) carried in Military Sealift Command controlled and chartered ships, loading and unloading all classes of cargo carried in Air Mobility Command controlled aircraft, and operating limited ocean terminal and expeditionary air terminals.

Naval Expeditionary Logistics Support Force (NELSF). A Naval Reserve command organized and staffed to provide a wide range of supply and transportation support critical for peacetime support, crisis response, humanitarian, and combat service support missions.

O

Operational General Message (OPGEN). Maritime unique formatted messages used by both the U.S. Navy and NATO to promulgate general

matters of policy, instructions, and common aspects of operations, but also may include detailed instructions for warfare responsibilities.

Operational Task (OPTASK). Maritime unique formatted messages used by both the U.S. Navy and NATO to provide detailed information for specific aspects within individual areas of warfare and for tasking of resources. This includes logistics and may be issued at all levels above the unit and may be Navy-wide, focused on a particular theater or battle group.

T

Task Force Logistics Coordinator (TFLC). Person designated by the task force commander to coordinate all logistics within the task force.

U

Underway Replenishment Coordinator (URC). The URC monitors commodity levels within the battle group and on board CLF ships in company or en route. When potential problems are identified, the URC notifies the BFLC/BGLC with recommended solutions. In the event commodity shortages are anticipated, the URC is responsible for allocation of available inventories. The URC coordinates loading and prioritization of products with the ALSS and recommends replenishment at sea (RAS) schedules to the BFLC/BGLC. While the supply officer is generally tasked with hazardous material and waste management on board, the URC coordinates the transfer of these materials to designated shuttle ships. It should be noted that the URC does not control actual UNREP operations; the Commanding Officer of the replenishment ship is the Officer in Tactical Command (OTC) during transfer.

Unit Identification Code (UIC). A six-character, alphanumeric code that uniquely identifies each Active, Reserve, and National Guard unit of the Armed Forces. Also called UIC. Unit identification codes and related information are listed in the Navy Comptroller Manual, Volume 2, Chapter 5. The unit identification code is normally preceded by a one-digit service designator code N, R, or V, as appropriate.

LIST OF ACRONYMS/ABBREVIATIONS

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A

ABFC. Advanced Base Functional Component.

ACCIS. Allied Command and Control Information System.

ACE. Aviation Combat Element.

ADAMS. Allied Deployment and Movement system (NATO).

AIT. Automatic identification technology.

ALSS. Naval advanced logistics support site.

APOD. Aerial Port of Debarkation.

APOE. Aerial Port of Embarkation.

B

BFIMA. Battle force intermediate maintenance activity.

BFLC. Battle force logistics coordinator.

C

CHOP. Change of operational control.

CHRIMP. Consolidated hazardous material reutilization and inventory management program.

CINCROKUS. Commander in Chief, Republic of Korea/U.S. Forces.

CINCUNC. Commander in Chief, United Nations Command.

CLF. Combat logistics force.

CMC. Commandant of the Marine Corps.

CNFJ. Commander, U.S. Naval Forces Japan.

CNFK. Commander, U.S. Naval Forces Korea.

CNO. Chief of Naval Operations.

COA. Course of action.

COCOM. Combatant command.

COMMARCORLOGBASES. Commander, Marine Corps Logistics Bases.

COMNAVAIRLANT. Commander, Naval Air Force, Atlantic.

COMNAVAIRPAC. Commander, Naval Air Force, Pacific.

COMNAVRESFOR. Commander, Naval Reserve Force.

COMNAVSURFLANT. Commander, Naval Surface Force, Atlantic.

COMNAVSURFPAC. Commander, Naval Surface Force, Pacific.

COMSC. Commander, Military Sealift Command.

COMSUBLANT. Commander, Submarine Force, Atlantic.

COMSUBPAC. Commander, Submarine Force, Pacific.

COMUSNAVCENT. Commander in Chief, Naval Forces Central Command.

CONCAP. Construction capability.

List of Acronyms

CONPLAN. Operation plan in concept format.

CONUS. Continental United States.

CSS. Combat service support.

CSSE. Combat service support element.

D

DESP. Defense Energy Supply Points.

DLA. Defense Logistics Agency.

DLR. Depot-level repairable.

DOD. Department of Defense.

DOT. Department of Transportation.

DPG. Defense Planning Guidance.

DSC. Defense supply center.

DTS. Defense transportation system.

F

FILL. Fleet issue load list.

FLS. Naval forward logistics site.

FLSR. Forward logistics support representative.

FMC. Field mail center.

FMSO. Fleet Material Support Office.

FSSG. Force service support group.

G

GCE. Ground combat element.

GCSS. Global Combat Support System.

GSA. General Services Administration.

H

HN. Host nation.

I

ICP. Inventory control point.

ILS. Integrated logistics support.

IMM. Integrated materiel management/manager.

ITV. In-transit visibility.

J

JCS. Joint Chiefs of Staff.

JEL. Joint Electronic Library.

JFC. Joint force commander.

JFLCC. Joint force land component commander.

JLOTS. Joint logistics over-the-shore.

JOPES. Joint Operation Planning and Execution System.

JPEC. Joint Planning and Execution Community.

JSCP. Joint Strategic Capabilities Plan.

JTAV. Joint total asset visibility (proposed).

List of Acronyms

JTF. Joint task force.

L

LC. Logistics coordinator.

LFSP. Landing force support party.

LMSR. Large, medium speed roll-on/roll-off.

LOC. Line of communications.

LOG. Logistics.

LOGBASE. NATO logistics database program.

LOGCAP. Logistics capability; Logistics Civilian Augmentation Program.

LOGREP. Logistics replenishment; Logistics Reporting System.

LOTS. Logistics over-the-shore.

LRC. Logistics readiness center.

M

MAGTF. Marine air-ground task force.

MARAD. Maritime Administration.

MARCORLOGBASES. Marine Corps Logistics Bases.

MARCORMATCOM. Marine Corps Materiel Command.

MARCORSYSCOM. Marine Corps Systems Command.

MARDIV. Marine Division.

MARFOR. Marine Corps forces.

MAT. Medical analysis tool.

MATCONOFF. Material control office.

MAW. Marine Aircraft Wing.

MC. Military committee.

MEF. Marine Expeditionary Force.

METT-T. Mission, enemy, terrain and weather, troops and support available, time available.

MEU(SOC). Marine Expeditionary Unit (Special Operations Capable).

MJLC. Multinational Joint Logistics Centre.

MNC. Major NATO commander.

MNFC. Multinational Force Commander.

MNMF. Multinational maritime force.

MOOTW. Military operations other than war.

MPF. Maritime prepositioning force.

MPS. Maritime prepositioning ship.

MRE. Meal, ready to eat.

MRI. Message routing instruction.

MSC. Military Sealift Command.

MSR. Main supply route.

MTMC. Military Traffic Management Command.

MWR. Morale, welfare, and recreation.

List of Acronyms

N

NAC. North Atlantic Council.

NACC. Navy Air Cargo Company.

NATO. North Atlantic Treaty Organization.

NAVAIRSYSCOM. Naval Air Systems Command (Also called NAVAIR).

NAVFA. Naval Facilities Engineering Command (Also called NAVFACENGCOM).

NAVFOR. Navy Forces.

NAVMASSO. Navy Management Systems Support Office.

NAVMEDLOGCOM. Naval Medical Logistics Command.

NAVPETOFF. Navy Petroleum Office.

NAVSEA. Naval Sea Systems Command (Also called NAVSEASYSYSCOM).

NAVSUP. Naval Supply Systems Command (Also called NAVSUPSYSCOM).

NAVTRANSSUPCEN. Naval Transportation Support Center.

NBG. Naval beach group.

NCA. National Command Authorities.

NCC. Navy component commander.

NCCP. Navy Contingency Contracting Program.

NCF. Naval Construction Force.

NCHB. Navy Cargo Handling Battalion.

NELSF. Naval expeditionary logistics support force.

NEO. Non-combatant evacuation operation.

NFCS. Navy field contracting system.

NGO. Non-governmental organization.

NMCB. Naval mobile construction battalion.

NRCC. Navy regional contracting center.

NSE. Navy support element.

NSN. National stock number.

O

OCONUS. Outside the continental United States.

OPCON. Operational control.

OPGEN. Operational general message.

OPLAN. Operation plan.

OPORD. Operational order.

OPTAR. Operating target.

OPTASK. Operational task.

OPTEMPO. Operating tempo.

P

PHIBCB. Amphibious construction battalion.

PMC. Passenger/mail/cargo.

POD. Point of debarkation/discharge or proof of delivery

List of Acronyms

POE. Point of embarkation; point of entry.

POL. Petroleum, oils and lubricants.

PVO. Private voluntary organization.

R

RC. Repair coordinator.

RDD. Required delivery date (at destination).

RFI. Request for information.

RRF. Ready reserve force.

RSOI. Reception, staging, onward movement, and integration.

S

SACEUR. Supreme Allied Command, Europe.

SACLANT. Supreme Allied Command, Atlantic.

SALTS. Streamlined automated logistics transmission system.

SECDEF. Secretary of Defense.

SECNAV. Secretary of the Navy.

SFM. Supply and financial management.

SIGMA. Shore intermediate maintenance activity.

SLOC. Sea line of communication.

SOF. Special operation forces.

SOFA. Status-of-forces agreement.

SOP. Standing operating procedure.

SPAWAR. Space and Naval Warfare Systems Command.

SPMAGTF. Special Purpose Marine Air Ground Task Force.

SPOD. Sea port of debarkation.

SPOE. Sea port of embarkation.

SSB. Supply Support Battalion.

SYSCOM. Systems command.

T

T-AFS. Combat stores ship (MSC).

T-AH. Hospital ship (MSC).

T-AOE. Fast combat support ship (MSC).

T-ATF. Fleet ocean tug (MSC).

T-AVB. Aviation logistics support ship (MSC).

TAMS. Transportation Analysis, Modeling and Simulation.

TAV. Total asset visibility.

TC-AIMS II. Transportation Coordinator's Automated Information for Movement System II.

TF. Task force.

TFLC. Task Force Logistics Coordinator.

TG. Task group.

TPFDD. Time-phased force and deployment data.

TPFDL. Time-phased force and deployment list.

TYCOM. Type commander.

U

UMMIPS. Uniform material movement and issue priority system.

UN. United Nations.

UNREP. Underway replenishment.

URC. Underway Replenishment Coordinator.

URG. Underway replenishment group.

USCENTCOM. United States Central Command.

USCG. United States Coast Guard.

USCINCTRANS. Commander in Chief, United States Transportation Command.

USEUCOM. United States European Command.

USJFCOM. United States Joint Forces Command.

USPACOM. United States Pacific Command.

USSOCOM. United States Special Operations Command.

USSOUTHCOM. United States Southern Command.

USSPACECOM. United States Space Command.

USSTRATCOM. United States Strategic Command.

USTRANSCOM. United States Transportation Command.

V

V/STOL. Vertical/short takeoff and landing.

List of Acronyms

VC. Fleet Composite Squadron.

VERTREP. Vertical replenishment.

VISA. Voluntary Intermodal Sealift Agreement.

VOD. Vertical onboard delivery.

VR. Fleet Logistics Support Squadron.

VRC. Fleet Logistics Support Squadron, Carrier Onboard Delivery (COD).

W

WRM. War reserve materiel.

SUGGESTED FOLLOW-ON READING

The naval professional wanting additional information on logistics operations and related topics may have interests varying from a direct requirement for assistance conducting this day's operations, to an esoteric interest in the foundations of logistics theory. This section is organized to simplify the search by separating the listings into general areas. The most important areas for direct application of logistics doctrine is the extensive Navy Warfare Publication (NWP) and United States Marine Corps Warfighting Publication (MCWP) libraries. These resources offer one or more substantive volumes in each of the functional areas of logistics, and expand on doctrine with more detailed discussions of organizational, technical, and procedural matters. Of most direct concern here is the NWP-4 and MCWP-4 series of logistics publications, which provide excellent guidance for the conduct of naval logistics operations, and include substantial information common to naval logistics operations. Readers are reminded that these libraries are a living resource; various publications within the library will be under development or revision at any point. This process is necessary to maintain currency of the information presented. In addition, the numbering and naming of some publications may change. The simplest way to view these publications is via the respective websites of the Navy Warfare Development Command (www.nwdc.navy.smil.mil) and the Marine Corps Combat Development Command (www.mccdc.usmc.mil).

Also listed in the suggested reading are representative Joint, and Allied publications rich in doctrinal or operational information. The NATO publications are particularly interesting to anyone involved in naval logistics. The list offered is not comprehensive, but is intended to indicate the scope of available information on doctrine and practices governing naval, joint, and combined logistics operations. Joint and combined operations constitute such a major portion of all military operations today that every naval professional will find a direct need to understand and operate in the joint and combined environments. The current joint publications listed here, and some service publications, may be accessed online from the Joint Electronic Library at <http://www.dtic.mil/doctrine>. This library is also available from the Joint Warfighting Center on CD-ROM.

Finally, for those naval professionals wanting to further their understanding of logistics history and theory, a brief selection of relevant titles is

offered. These include topics on military and naval theory and operations, logistics theory and history, developing doctrine, and command and control. They are not expected to assist the operational commander, planner, or logistician in the daily discharge of duty; they offer a few of the many possible opportunities to broaden the perspectives from which we approach our duties.

Navy Publications

Naval Doctrine Publication 1, Naval Warfare

Navy Warfare Publication 3-02.14, The Naval Beach Group

Navy Warfare Publication 3-02.21, MSC Support of Amphibious OPS

Navy Warfare Publication 3-02.3, Maritime Prepositioning Force (MPF) Operations

Navy Warfare Publication 4-01, Naval Transportation

Navy Warfare Publication 4-01.1, Navy Expeditionary Shore-Based Logistics Support and RSOI

Navy Warfare Publication 4-01.4, Underway Replenishment

Navy Warfare Publication 4-02, Naval Force Medical Protection

Navy Warfare Publication 4-02.2, Patient Movement

Navy Warfare Publication 4-02.4, Fleet Hospitals

Navy Warfare Publication 4-02.5, USMC Health Service Support Operations

Navy Warfare Publication 4-04, Naval Civil Engineering Operations

Navy Warfare Publication 4-04.1, Seabee Operations in the MAGTF

Navy Warfare Publication 4-04.2, Navy Civil Engineer Operations for Component Commanders

Suggested Reading

Navy Warfare Publication 4-07, Naval Maintenance

Navy Warfare Publication 4-08, Naval Supply Operations

Navy Warfare Publication 4-09, Other Logistics Services, Part I – VIII

Navy Warfare Publication 4-10, Naval Conventional Ordnance Management

Navy Warfare Publication 4-11, Environmental Protection

Naval Doctrine Publication 5, Naval Planning

Navy Warfare Publication 5-01, Navy Operational Plans

Naval Doctrine Publication 6, Naval Command and Control

Navy Warfare Publication 6-00.1, Command and Control

Marine Corps Publications

Marine Corps Doctrine Publication 4, Logistics

Marine Corps Warfighting Publication 3-17, Engineer Operations

Marine Corps Warfighting Publication 4-1, Logistics Operations

Marine Corps Warfighting Publication 4-11, Tactical Level Logistics

Marine Corps Warfighting Publication 4-11.1, Health Services Support Operations

Marine Corps Warfighting Publication 4-11.2, Patient Movement

Marine Corps Warfighting Publication 4-11.3, Transportation Operations

Marine Corps Warfighting Publication 4-11.4, Maintenance Operations

Marine Corps Warfighting Publication 4-11.6, Bulk Liquids

Marine Corps Warfighting Publication 4-11.7, MAGTF Supply Operations

Marine Corps Warfighting Publication 4-11.8, Services

Marine Corps Warfighting Publication 4-12, Operational Level Logistics

Marine Corps Doctrine Publication 5, Planning

Marine Corps Doctrine Publication 6, Command and Control

Joint Publications

Joint Publication 3-07, Joint Doctrine for Military Operations Other Than War

Joint Publication 3-08, Interagency Coordination During Joint Operations

Joint Publication 3-17, Joint Tactics, Techniques, and Procedures for Theater Airlift Operations

Joint Publication 3-34, Joint Engineer Doctrine

Joint Publication 3-35, Joint Deployment and Redeployment Doctrine

Joint Publication 4-0, Joint Doctrine for Logistics Support of Joint Operations

Joint Publication 4-01, Joint Doctrine for the Defense Transportation System

Joint Publication 4-01.1, Joint Tactics, Techniques, and Procedures for Airlift Support to Joint Operations

Joint Publication 4-01.2, Joint Tactics, Techniques, and Procedures for Sealift Support to Joint Operations

Joint Publication 4-01.3, Joint Tactics, Techniques, and Procedures for Movement Control

Joint Publication 4.01.4, Joint Theater Distribution

Joint Publication 4-01.5, Joint Tactics, Techniques, and Procedures for Water Terminal Operations

Suggested Reading

Joint Publication 4-01.6, Joint Tactics, Techniques, and Procedures for Joint Logistics Over the Shore

Joint Publication 4-01.7, Joint Tactics, Techniques, and Procedures for Use of Intermodal Containers in Joint Operations

Joint Publication 4-01.8, Joint Reception, Staging, Onward Movement, and Integration (JRSOI)

Joint Publication 4-01.9, Global Distribution

Joint Publication 4-02, Joint Doctrine for Health Service Support in Joint Operations

Joint Publication 4-02.1, Joint Tactics, Techniques, and Procedures for Health Service Logistics Support in Joint Operations

Joint Publication 4-02.2, Joint Tactics, Techniques, and Procedures for Patient Movement in Joint Operations

Joint Publication 4-03, Joint Bulk Petroleum Doctrine

Joint Publication 4-04, Joint Doctrine for Civil Engineering Support

Joint Publication 4-05, Joint Mobilization Planning Doctrine

Joint Publication 4-05.1, Joint Tactics, Techniques, and Procedures for Manpower Mobilization and Demobilization Operations: Reserve Component Callup

Joint Publication 4-06, Joint Tactics, Techniques, and Procedures for Mortuary Affairs in Joint Operations

Joint Publication 4-07, Joint Tactics, Techniques, and Procedures for Common User Logistics during Joint Operations

Joint Publication 4-08, Joint Doctrine for Logistic Support of Multinational Operations

Joint Publication 5-0, Joint Doctrine for Planning Joint Operations

Joint Publication 5-00.2, Joint Task Force (JTF) Planning Guidance and Procedures

Allied Publications

Allied Joint Publication – 4, Allied Joint Logistic Doctrine

Allied Logistics Publication – 11, Multinational Maritime Force Logistics

Allied Tactical Publication – 16, Replenishment At Sea

Professional Interest

Allard, Kenneth, Command, Control, and the Common Defense, rev. ed. (Washington, DC: National Defense University, 1996).

Ballantine, Duncan S., U.S. Naval Logistics in the Second World War (Newport, RI: Naval War College Press, 1998).

Carter, Worrall R., Beans, Bullets, and Black Oil (Washington, DC, 1953).

Clausewitz, Karl von, On War. Ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976).

Congressional Budget Office, Moving U.S. Forces: Options for Strategic Mobility (Washington, DC: U.S. Govt. Printing Office, 1997).

Conrad, Scott W., Moving the Force: Desert Storm and Beyond (Washington, DC: National Defense University, December 1994)

Dyer, George C., Naval Logistics (Annapolis, MD: Naval Institute Press, 1960).

Hooper, Edwin B., Mobility, Support, Endurance (Washington, DC: Naval History Division, Department of the Navy, 1972).

Magruder, Carter B., Recurring Logistics Problems as I have Observed Them (Washington, DC: U.S. Army Center of Military History, 1991).

Suggested Reading

Mahan, Alfred Thayer, Mahan on Naval Strategy. Ed. J.B. Hattendorf (Annapolis, MD: Naval Institute Press, 1991).

Matthews, James K. and Cora J. Holt, So Many, So Much, So Far, So Fast: United States Transportation Command and Strategic Deployment for Operation Desert Shield/Desert Storm (Washington, DC: Office of the Chairman, Joint Chiefs of Staff, 1999).

Pagonis, William G., Moving Mountains: Lessons in leadership and logistics from the Gulf War (Boston, MA: Harvard Business School Press, 1992).

Schrader, Charles R., U.S. Military Logistics, 1607-1991: A Research Guide (New York: Greenwood Press, 1992).

Sun Tzu, The Art of War. Ed. Samuel B. Griffith (New York: Oxford University Press, 1963).

Turner, George Edgar, Victory Rode the Rails: The Strategic Place of the Railroads in the Civil War (Westport, CT: Greenwood Press, 1992).

Van Creveld, Martin, Supplying War: Logistics from Wallenstein to Patton (New York: Cambridge University Press, 1977).

Wildenberg, Thomas, Gray Steel and Black Oil (Annapolis, MD: Naval Institute Press, 1996).

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Navy Warfare Development Command
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Newport, RI 02841

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